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THE INTERNATIONAL MAGAZINE FOR 3D ARTISTS

FLYING START

How to take off in the 3D industry

on the cd

>> *LightWave 6.5b* Mac-only update
>> *Kelseus Cloth* plug-in
>> dvGarage tutorial movies
>> 80 Noctua Graphics textures
>> *BESM* shader plug-in for *LightWave*
>> *o2c-Player* Web plug-in and objects
>> *IFW* shaders for *LightWave*
>> *Rustboy* intro movie
>> Top 20 *Poser* competition entries

EXCLUSIVE REVIEW

CINEMA 4D XL7

LIGHTWAVE 6.5B
CREATE UNIQUE MODELS

DREAMING IN 3D
CFC'S DIGITAL REVOLUTION

50 TEXTURE TIPS
WITH ALEX LINDSAY
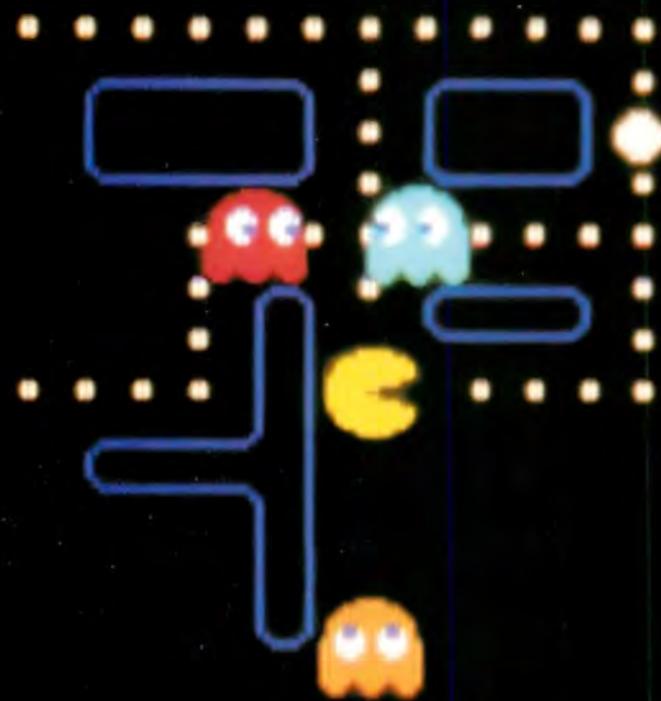
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editor's perspective

Summer is here and along with it, CG-heavy blockbuster films. Unfortunately, it seems that in some cases, the animation is more important than the storyline, leaving the films feeling flat and underdeveloped. Even more unfortunately, the blame for this usually falls on the CG in the film, rather than the acting, writing or direction.

In some cases, of course, the CG is definitely to blame. Just like general acceptance of the Internet as a universal medium for communication, it's about time graphics were seen as a universal enabling device for film makers rather than an awkward afterthought that needs to be shouted about in a film's PR.

Ben Vost

Editor

The critical list

MARK BRIERLEY is a freelance *Softimage* animator based in Bristol in the UK, with numerous CG-related projects under his belt.

MAT BROOMFIELD has been a journalist for over 10 years. He's a PC specialist with a penchant for creative computing.

GEORGE CAIRNS teaches students the joys of *Maya* by day; by night his alter-ego produces science fiction artwork for CCGs.

SIMON DANAHER is a Mac fiend who, with his brother Tim, corners the market in 3D-related reviews and tutorials.

SIMON DAVIES is the Managing Director of Sitracom and used to manage Avid UK.

PETE DRAPER, a *3ds max* expert, is Orchard Creative Design Group's senior 3D artist.

STEVE JARRATT Long-standing Future editor and *3D World* contributor, Steve loves his Mac and *LightWave*, as well as Bassett hounds.

ALEX LINDSAY works for San Francisco-based dvGarage. He previously worked on *Star Wars: Episode One* at JAK and ILM.

ROBERT MITCHELL spends most of his free time digital prototyping and writing for us.

SHELLEY PAGE is the European Representative for Animation at DreamWorks.

MARK RAMSHAW is a long-standing contributor to many games and design magazines and is a *3D World* mainstay.

NEIL RENNISON is busy working on a PlayStation 2 racing game for Oxford-based Razorworks.

BENJAMIN SMITH is 3D director at Stormfront Digital Pictures, an award-winning studio which specialises in producing animation and visual effects for TV and visitor attractions.

ANDY STOUT has been a journalist in the CG, film effects and post-production industry for nearly a decade.

GARRICK WEBSTER founded *3D World* in June last year. He currently edits our sister publication, *Computer Arts*.

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EXHIBITION

EXHIBIT YOUR CREATIONS

More exhibition images can be found on our Web site at www.3dworldmag.com. If you'd like to see your work displayed in the Exhibition section of the magazine, send us your 3D artwork. Supply your images rendered at print-resolution (ideally 3,000 pixels wide or high) on CD or Zip disk to the address below. Please note images resized in *Photoshop* are not of sufficient quality and won't be used. Files under 1.5MB in size can be sent to 3dw.exhibition@futurenet.co.uk. Alternatively, post them to Exhibition, *3D World*, 30 Monmouth Street, Bath BA1 2BW, United Kingdom

BE AN EXHIBITIONIST

If you are a young artist in 3D and you don't yet have a job with a major studio, we'd like to hear from you. We want your showreel to go on our CD, a cool collection of pictures and a promise we'll hear from you when you get a job. See the address to the left.

S.M

02

03

[01 - 03]
SEBASTIAN MARQUEZ
OUTDOORS DANCE;
BULLFIGHTING;
UNDERWATER
3ds max, Painter
www.users.wineasy.se/snmz/
chano2.htm

[01] TREEHOUSE
PATRIK SPACEK
3ds max R3
patrikspacek@hotmail.com

01

[02] STRANGE FRUIT
ANTERO PEDRAS
3ds max 3.1
anteropedras@yahoo.com
antero.neuronblast.com

02

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01

02 03

04
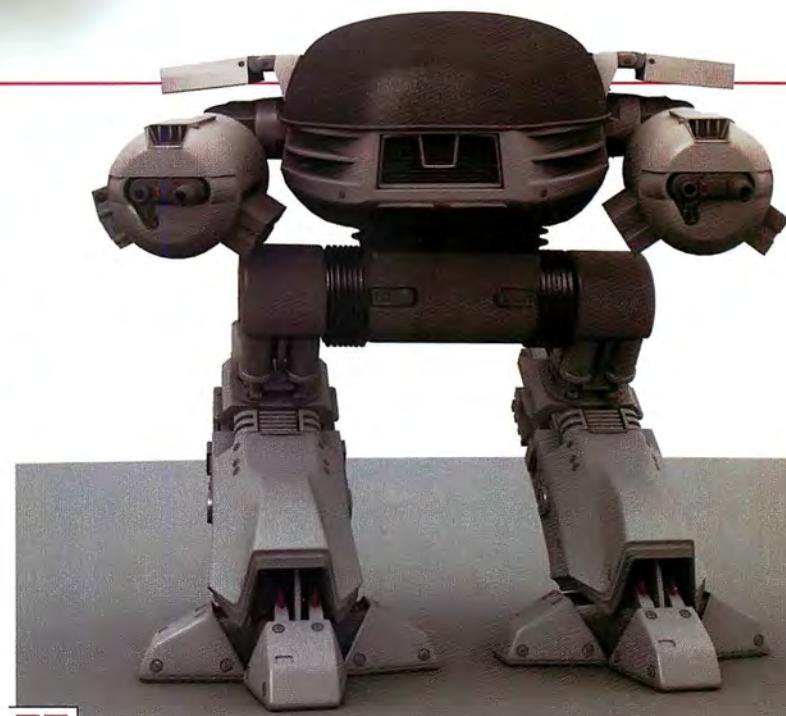
[01] GAMEBOY
PETER CRACKNELL
Rhino 1.1, Moray 3.3, POVRay
pc@lineone.net
www.petercracknell.com

[02] KORINTH SPIN OFF
STEFAAN CONTRERAS
Maya 3, Photoshop
stefaan.contreras@pandora.be

[03] ED209
JAMES BUSBY
LightWave 6
www.student.brad.ac.uk/jabusby

[04] STAIRCASE ON FRISHMAN
STREET
TAL ZANA
3ds max, Photoshop
talzana@wanadoo.fr

[05] SUNFLOWER
SHARON WONG
Maya
stweetywong@aol.com
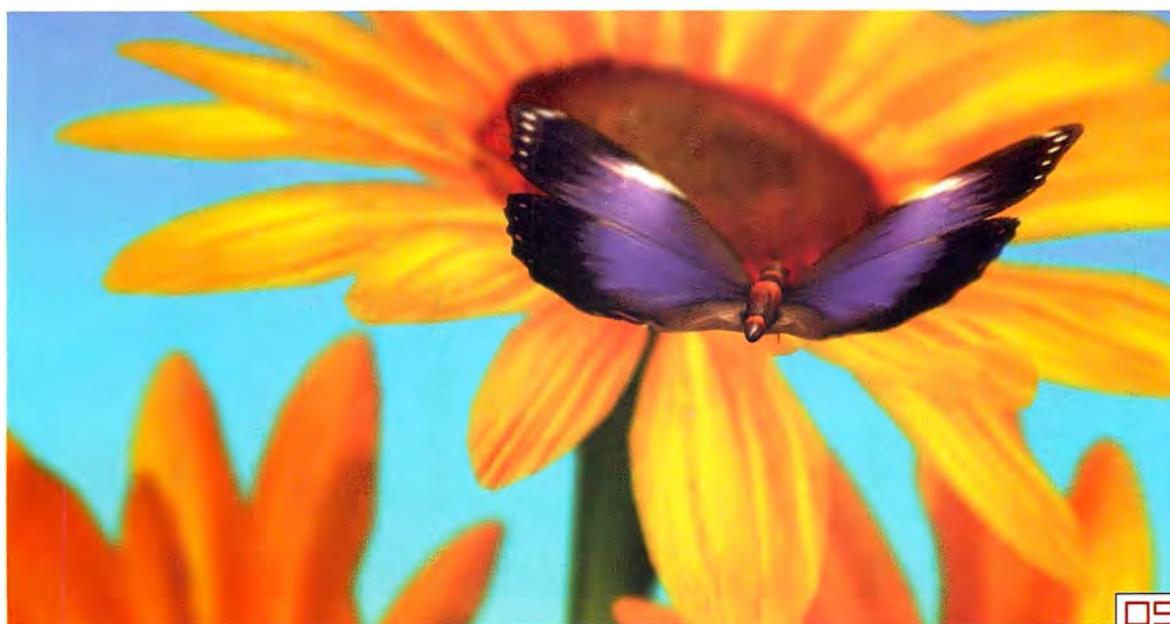
05

ex**HIBITIONIST**

This month, a product-design student uses *Maya* to parody a translucent robotic futuroid

London-based animator Badheer Ballam is currently in the home stretch of his 3D Product Design course at Ravensbourne College, putting the finishing touches to his final-year project and competing for rendertime with his fellow students like thirsty bison around a gushing geyser. The fact that he's animating anything at all happened more by accident than design. "I started doing product design – I've always been into art and design," he explains. "Halfway through, I started using *3ds max* and we got brief tutorials as a basic introduction. I picked it up from there and started losing interest in product design," he adds.

His first animation, *Introducing R23*, is included on this month's coverdisc and came about in response to a brief dealing with the possibility, potential effects and marketability of artificial intelligence. Following a work experience stint at Arcana Design, Badheer migrated from *max* to *Maya* and busied himself creating a mock product advert for a morphing household robot, complete with hard-sell voiceover. The advert was inspired by the kind of lifestyle-transforming inventions that appear in the middle of the night on Cable shopping channels.

"The Internet fridge, stuff like that – there are so many useless products that just use the advertising in a big way to sell them. It's a parody of that kind of invention," Badheer says. The star of the piece fits into the sci-fi tradition of cute robots, sharing the exaggerated movements that take the place of facial expressions to convey a sense of character. Badheer's product-design background led to plenty of preparation. It was only after 50 pages had been filled with robot sketches that *R23* was selected.

The original animatic version experimented with a side-on perspective originally inspired by Pixar's *Luxo Jr*, but halfway through this was abandoned in favour of the more kinetic camerawork in the finished version. The backgrounds are deliberately sparse; Badheer was mindful of the importance of keeping attention focused firmly on character throughout, figuring that the voiceover would provide enough of a distraction on its own.

For his major project, Badheer has travelled back in time, using dinosaurs of all things to illustrate the theme of asylum seekers and the way they're represented in the media. "I'm looking at organic shapes and organic movement, looking at muscle deformation and modelling from scratch, creating the whole character," he explains. "It's not a typical T-Rex, it's got arched backwards-facing legs and stuff, it's a bit surreal."

Once he's graduated, Badheer plans to get a job in 3D and progress to working on special effects movies. Despite the desire to work on spectacular sequences, however, he doesn't want to succumb to the prevailing trend in CG for spectacle over narrative. "A lot of people seem to be more into rendering techniques, global illumination and radiosity than what they're actually saying in their work," he notes. "For the first 30 seconds or so, audiences will appreciate good lighting or texturing or whatever, but after that, you've lot their interest. For me, it's all about the message behind the technical viewpoint."

BADHEER BALLAM
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Maya, 3ds max
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www.bballam.com
+44 (0)792 934 8820

Badheer's showreel is on the CD
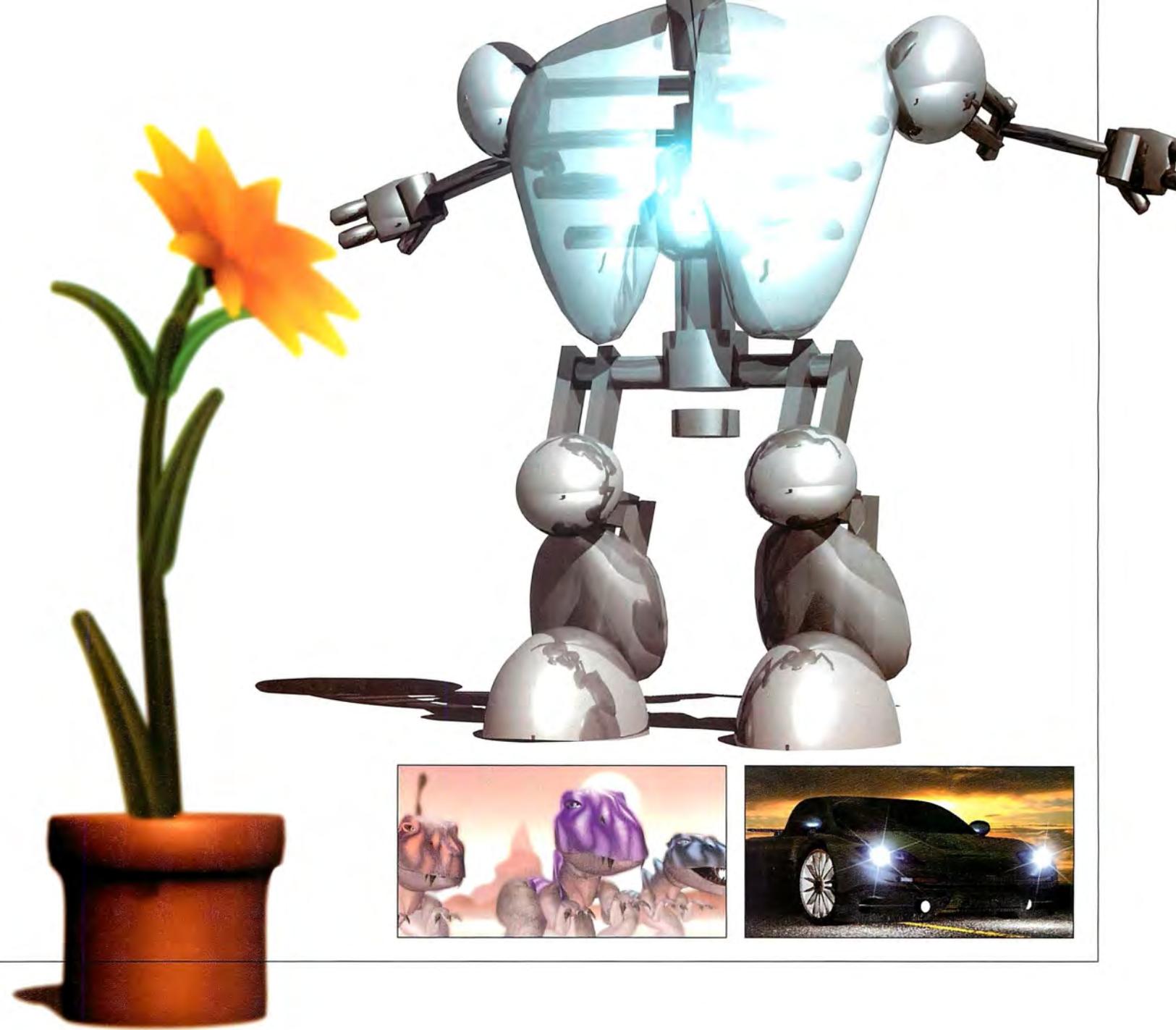
3D world news

More hot tools for 3D artists

The *3D Toolkit* from dvGarage, featuring *ElectricImage* for the Mac and a tutorial bundle, promises to offer the best-value stepping stone into 3D yet

Mac users, so long regarded as the poor relations of their spoilt PC counterparts when it comes to support from 3D software companies, will soon have something to shout about aside from the promise of OS X. San Francisco-based dvGarage has developed *3D Toolkit*, an entry-level solution based on Mac favourite *ElectricImage*, which goes the extra mile to provide its users with training in the principles of 3D thanks to a bundle of tutorials and overviews which home in on the heart of the matter – getting over the initially steep learning curve.

3D Toolkit consists of five separate elements: the Animation System, which is essentially *ElectricImage 2.9.2*; the Modeller, which is version 1.0 with the Non-Uniform scale capability added; a set of Basic Tutorials; an Advanced Tutorial, and finally, Bonus Materials selected from dvGarage's own in-house collection of models, grunge maps and surface settings developed from its *Surface Toolkit* expertise. But the most revolutionary feature of all is the price – $199 for an application that has played its part in Hollywood since Chewie first made the jump to light speed.

Alex Lindsay, dvGarage supremo, puts the release into perspective. "The *3D Toolkit*, as with the *Surface Toolkit*, is really an extension of my experience of working my way up in computer graphics. I certainly didn't go to school for computer graphics – I interned where there were machines, talked to anyone who knew more than me and clawed my way to ILM," he says. "My singular goal with dvGarage is to simply create a path for others to have what I have been fortunate enough to experience. I don't believe it has to be as hard as it was for me."

To back up this philanthropic motive, Alex emphasises that while *ElectricImage 2.9.2* actually lacks the UV mapping and IK constraints you'd expect of a top character-animation utility – and also omits physics, expressions and ray-tracing – the software is approachable to learn and has a tiered complexity that leads to significant power hidden beneath the surface. "*ElectricImage 2.9.2*'s ability to render massive scenes is unparalleled," Alex says. "I've personally had scenes with two million polygons, 300MBs of textures and 30–40 lights with render times at film-res in the range of 10–15 minutes per frame. Most applications can't even deal with those kinds of numbers."

Each area of the *3D Toolkit* has a 20-minute overview, refreshingly free of what Alex describes as the scan-converter technique of training, where unconscious filler time takes up three quarters of the presentation, resulting in rigor mortis on the viewer's part. There are also five Basic tutorials for both the Modelling and Animation System, dealing with the building blocks – and once these have been mastered, an Advanced tutorial walks the user through a single project incorporating modelling, texturing, lighting and rendering. Whether or not the *3D Toolkit* will put the relatively high cost of entry-level 3D software into perspective is another matter. "The issue is, there are good reasons the applications out there cost so much," Alex says. "You have constant bug fixes, technical support which, as you lower the cost becomes far more of a challenge due to less-experienced users, marketing manuals, etc. We're not saying everyone should sell their application for a hundred bucks, but if you're starting in 3D, you need a cost-effective way to truly learn production methodologies," he concludes. Look out for a forthcoming review of the *3D Toolkit* in *3D World*, and in the meantime visit the site below for more information.

CONTACT: www.www.dvgarage.com

RIGHT Learning 3D is a big commitment. The *3D Toolkit* from dvGarage aims to give you a head start in creating renders such as this, and comes with focused tutorials included in the $199 asking price.

SPECTRE BEHIND GLASS

The latest classic car to roar throatily out of legendary American manufacturer, Cadillac will do so with the benefit of Glassworks' animation, modelling and smoke-creation expertise. The Soho company was commissioned by Spectre to create a range of elements to reassure potential clients that the sporty Cadillac Escalade is no slouch in the speed stakes, and will protect you in the increasingly likely event of an inner city missile attack, or if you're ever unfortunate enough to be pursued by a dinosaur made of traffic cones.

For the smoke effects in the advert, Glassworks used its own proprietary smoke effects plug-in, which was integrated into Mental Images' *mental ray*. The plug-in enjoys the distinction of being able to create an unlimited quantity of fully editable smoke trails to a 3D scene.

Peter Reilly, part of Glassworks' R&D team, explains the plug-in's capabilities further. "The smoke plug-in accurately represents the convection, billowing and expansion of smoke using many millions of implicit particles. Light can penetrate through the smoke, giving it a nice halo effect when backlit," he says. "As the smoke is raytraced, it interacts fully with the scene, it's visible in reflections, it casts shadows, occludes objects and allows the camera to pass through it with ease." Sounds like Glassworks' animators will never be without quality smoke again.
CONTACT: www.glassworks.co.uk

Shots from the Glassworks-aided Cadillac ad.

SUMMER SHOWCASE
Send in your showreels for the *3D World* Summer Showcase (the deadline is 29 June) for inclusion in our SIGGRAPH issue.
CONTACT: 3dw.exhibition @futurenet.co.uk

POSER PRO PACK UPDATE
A free service pack update for *Poser Pro Pack* is available for immediate download from the Web site below, courtesy of Curious Labs. A principal feature is the inclusion of plug-in support for hosting *Poser* scenes in *3ds max 4*.
CONTACT: www.curiouslabs.com

X-BOX LAUNCH REVEALED
Microsoft has announced an estimated retail price of $299 and a release date of 8 November 2001 for its Xbox console. The plans, outlined at E3 2001, stated that the console will initially be available at outlets throughout North America. The company assures us that 600,000 to 800,000 units and between 10 to 15 games will be available right from day one, but quite why it chooses to emphasise this is anybody's guess.
CONTACT: www.xbox.com

NDL AND DISCREET ALLIANCE
American company Numerical Design Ltd has signed an agreement with Discreet that will enable developers using Discreet's gmax development platform a direct export path to the *NetImmerse* game engine. NDL's *MAXImmerse* plug-in will allow gmax developers to export level content to *NetImmerse* and preview content in real-time on Xbox, PS2, PC or Gamecube platforms. For more information, visit the site below.
CONTACT: www.ndl.com

VERTI-GO FOR MAX
Critical Mass Labs is currently offering a free download of *Vertigo*, its real-life physics simulator plug-in for *3ds max*.
CONTACT: www.cm-labs.com

AND THE WINNER IS...

3D Festival has announced the categories for the coolest award of the year. The 3D Festival Awards, presented in conjunction with *3D World* magazine, rewards outstanding achievements by European individuals and companies in the field of 3D computer graphics. The categories for this year are: 3D Animated Short, 3D in Commercial, 3D in Feature Film, Character Design, Game Intro, Logos & Idents, Student 3D Animation, Student 3D Still, Architectural Visualisation, Industrial Design, Excellence in Digital Art & Design – The Digital Hall of Fame Award, and Community Contribution for good measure.

The deadline for submissions is 31 August, so it's time to get busy. All of the information about submissions procedure, rules, etc, is on the 3D Festival site at www.3dfestival.com/award, and the awards are sponsored this year by Alias|wavefront, Avid, Compaq, Discreet and Newtek. Incidentally, the jury list is starting to look like a who's who of European 3D, with Mike Milne, Framestore; Shelley Page, DreamWorks; Anders Rönnblom, EFX Art & Design; Alex Morris, Hayes Davidson; Knut Ramstad, Telenor Expo, and your humble servant Ben Vost, editor of *3D World* magazine already confirmed. Four more jury members will be appointed over this month.

The 3D Festival organisers have also been busy booking speakers for the conference. For an up-to-date list of who is going to speak at this year's festival, take a look at the site below.
CONTACT: www.3dfestival.com/ conference

Bronze balls replace Golden Globes at the 3D Festival Awards.

Lara loses Cherry to monster gang

The Mill recycles some of *Tomb Raider's* CG to sell soft drinks

The Mill has created a spin-off commercial from the forthcoming *Tomb Raider* movie for Wild Cherry Pepsi. The ad was shot at one of the film's Pinewood studio sets and features models of stone soldiers which were originally created by Mill Film. Live action was tracked in using *3D Equaliser*, before 3D elements modelled and textured in *Softimage|3D* and rendered using *mental ray* were added. The Mill created a bouncy Wild Cherry Pepsi can in 3D, which is ultimately responsible for distracting the soldiers and saving Lara from the clutches of her stony assailants.
CONTACT: www.mill.co.uk
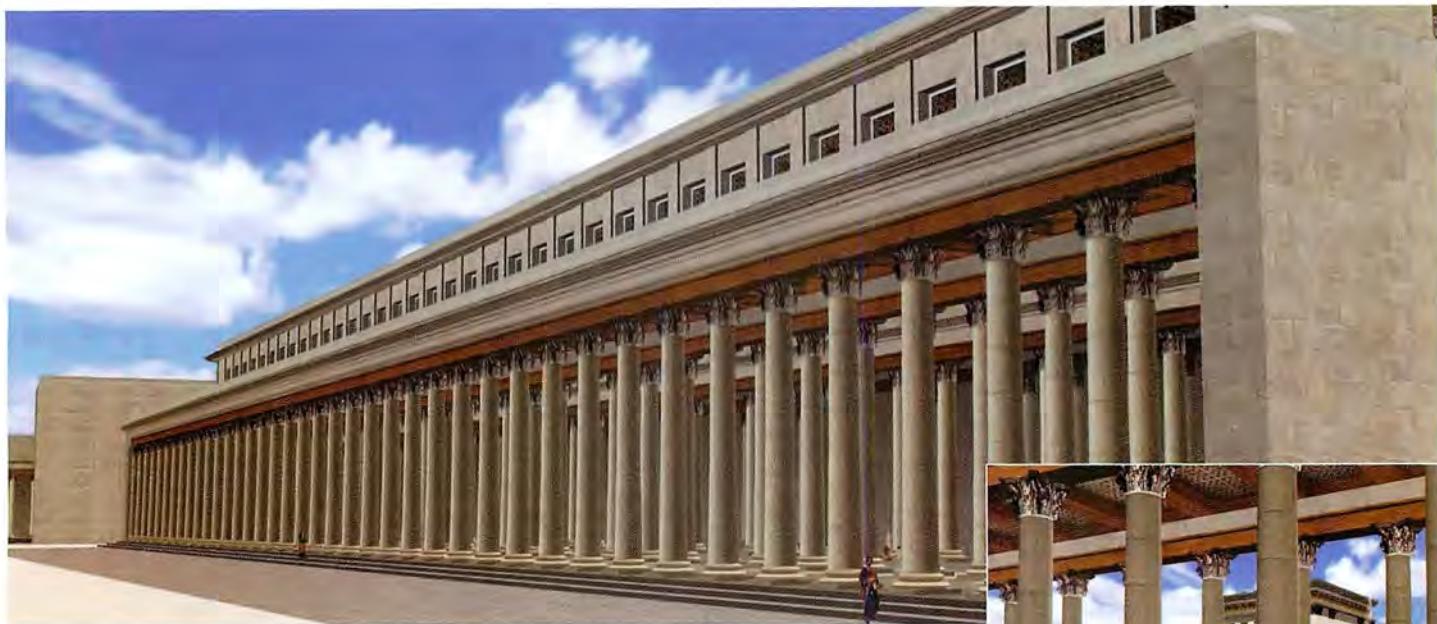
SGI makes history

The Davidson Centre in Jerusalem brings the past to life with SGI

SGI's Silicon Graphics Onyx 2 InfiniteReality 3 visualisation system is being used to power an exhibition in Jerusalem, which reconstructs the Herodian Temple Mount as it would have appeared two millennia ago before it was smashed to pieces by the Romans. Visitors can direct a virtual walkthrough around the ancient site in real-time, zooming in and out and changing direction thanks to the Onyx 2's 64-bit dual processors and a visual model created by the

Israel Antiques Authority and the University of California. The theatre at the Davidson Centre occupies an underground complex at the Israel Antiquities Authority's Jerusalem Archeological Park, and is one of many such exhibits springing up around the world. A similar SGI-powered facility in Mexico City is under development, aiming to recreate the city plaza El Zocalo in Aztec times. Elsewhere, Silicon Valley has played host to a reconstruction of Egypt's Tomb of Nefertari, and

Toppan Printing Co collaborated with SGI recently to provide a high-resolution virtual alternative to Tokyo's Toshodai-ji Temple while the original was being restored. For more info about SGI's large-scale simulation projections, visit the site below.
CONTACT: www.sgi.com/go/museum

"AT PEPPER'S GHOST, WE ARE **PUSHING THE LIMITS** OF 3D ANIMATION AND EFFECTS.
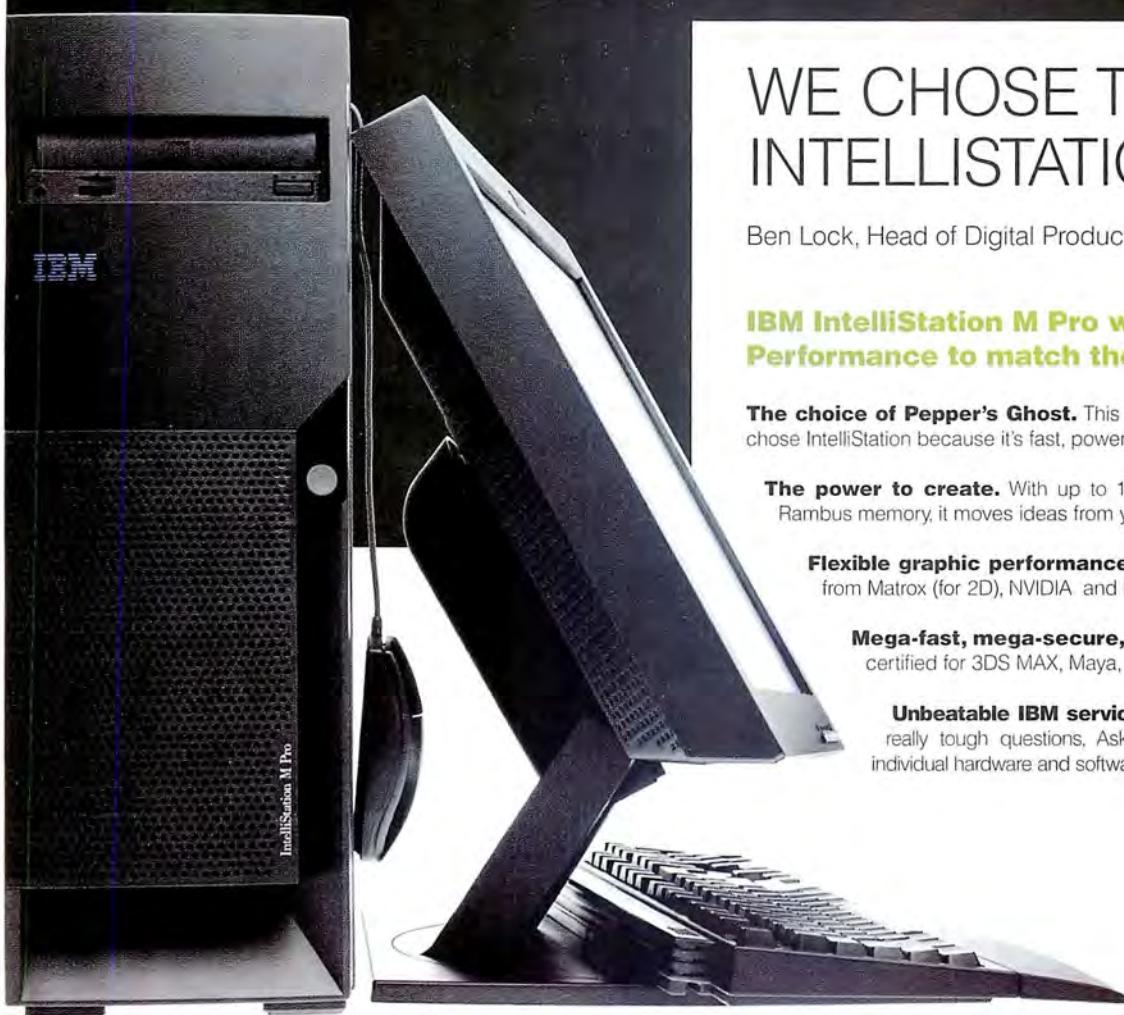
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Ben Lock, Head of Digital Production, Pepper's Ghost.

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Chocolate Mouse

Aero's new ad stars a hula-hooping rodent created by Glassworks and Passion Pictures

Hot on the paws of CFC's Guinness squirrel comes an equally ambitious 3D rodent, courtesy of a collaboration between Glassworks and Passion Pictures. The advert, created by Lowe Lintas for Aero chocolate, centres around a scene in which a businessman buys a chocolate bar from a newsagent and is offered the mouse as a bonus. The mouse performs an incredibly realistic hula-hoop routine, complete with a flourish at the end, but is still passed over in favour of the confectionery and left to trudge off to his chunk of cheese under the counter.

The 3D model of the mouse was created by Glassworks' head of 3D, Alistair Hearsum, and based on choreography developed by Passion Pictures' 2D animation director, Alyson Hamilton and visual effects director, Chris Knott. Glassworks was approached on account of its reputation for 3D animation, but also for its *FurShader* plug-in for *Softimage*, a proprietary development that Glassworks has been working on for the past three years. The plug-in enables artists to create an unlimited number of hairs on a model surface, which have dynamic movement capabilities. *FurShader* enables users to manipulate tip and root colour variables, density and the thickness and amount of tapering for each individual strand. The resulting hair is incredibly lifelike, even down to slight matting on the mouse's forehead, and compares favourably with the appearance of Hollywood mouse Stuart Little, which Glassworks realised would be used as a furry yardstick.

Animation and modelling took six weeks in total, with many revisions shared by Passion and Glassworks to ensure the mouse's performance was spot on. The mouse's believability was hard-won, according to Alistair Hearsum. "He had to move like a real mouse with realistic proportions and features. The look had to be spot-on, taking into account all the restrictive depth of field and motion blur you would get when shooting something that small on film," he explains. The 3D was composited and edited into the live action footage using *inferno*. To see the hairy hoopist in action for yourself, visit the Web site below.

CONTACT: www.allbubblenosqueak.co.uk

ESPRIT 4, D'ACCORD?

With *Bryce, World Construction Set* and plug-ins such as *Digital Nature Tools* already firmly established in the market, there's no shortage of tools offering the 3D artist varying degrees of power to shape the natural world. Europe's E-on Software has a reputation of its own in the field too, and *Vue 4*, its latest update to the award-winning *Vue D'Esprit*, is the cheapest option of them all at $199.

Vue 4 boasts enhanced architecture for ease-of-use, enabling users to get to grips with a range of tools for advanced realism. A new volumetric atmosphere system has been introduced to capture the complex interactions between air and light, resulting in volumetric clouds and materials. A stellar twist sees the addition of planets, moons and stars along with atmospheric effects such as rainbows and even ice rings. The Terrain Editor now offers real-time previews and the ability to create symmetrical terrains, and the integration of *SolidGrowth 2* with the software enables the application of trees and plants at a click, with a small memory footprint. *Vue 4* has import/export filters for a variety of movie formats and also allows direct import of static *Poser* scenes.

Special effects and rendering tweaks include luminous and glowing materials, light gels, unlimited transparency depth, new shadows, backlighting and anti-aliasing options for improved landscape contours. 40% faster rendering and OpenGL previews complete the scene, and the program will also be available in English, French, German and Japanese language versions.
CONTACT: www.e-onsoftware.com

ARIUS SCANNER

The long-awaited photo-realistic scanning service from Toronto-based Arius3D is now available for customers from all walks of digital life, including game, film, product and multimedia design. The technology that the service is based on, dubbed *Foundation*, was initially developed by Canada's National Research Council and represents something of a breakthrough thanks to its ability to simultaneously scan an object's true colour and geometry. The resulting scans offer microscopic-level colour data unaffected by ambient light, effectively by-passing the need to texture an object separately and also offering a quick way to group and separate parts and visually aid animation. The point cloud data also offers a fully scalable model, and models can also be either triangulated and decimated to a lower polygon count or selectively modelled from the point cloud data. Colour info from a scan can also be rendered out and created as a texture over-laid on a lower polygon count model, all of which should be beneficial to games developers, one of Arius3D's many target markets.

Arius3D has installed its systems in Utah and Toronto, with other service bureaus on their way, while portable units are also in the pipeline. To receive a quote or find out more about the technology behind the company's service, call +1 905 270 7999 or visit the Web site below.
CONTACT: www.arius3d.com

Arius 3D's scanning technology is the result of $20 million of research and development at Canada's National Research Council.

JULY 9-10
Principles of Virtual Reality
Sira and SPIE present a workshop about using virtual-reality techniques in engineering and related areas. The two-day event takes place in Bromley, UK, and includes a presentation on CG principles for VR, covering illumination, reflection and shading. Pay a visit to the site below for further information.
CONTACT:
www.sira.co.uk

AUGUST 12-17
SIGGRAPH
Los Angeles is the venue for this year's SIGGRAPH, as the mother of all computer shows once again promises a line-up of all the latest developments in 3D. The organisers are currently on the lookout for animations and art for this year's show, so visit the Web site for details on how to enter your work and for upcoming programme details, including a creative lab exploring brand-new developments.
CONTACT:
www.siggraph.org

OCTOBER 10-12
COMPUTER ARTS LIVE!
Our sister magazine's digital arts party returns, with speakers, seminars, products and awards covering all bases of the joys of digital creation. Expect an impressive array of speakers in a London location.
CONTACT:
www.computerarts.co.uk

OCTOBER 22-25
3D FESTIVAL
Øksnehallen in Copenhagen will host the 3D Festival, Europe's largest dedicated 3D event. Fun and games in store include speakers, awards ceremonies and all your favourite 3D exhibitors, all co-sponsored by *3D World*. See you there.
CONTACT:
www.3dfestival.com

PSUNAMI 2.0 FOR EL IMAGE

Northern Lights and Arete have released *Psunami 2.0* for ElectricImage's *Universe Animator*. The software has been used for numerous oceanic scenes in movies, and the new version consists of three integrated packages. The first, Psunami, creates ocean surfaces and geometry, calculates curved and linear boat wakes and applies bobbing motion to effectors. Ocean Optics contains algorithms for rendering aspects of oceanic appearance such as water coloration, glitter from light playing on the surface, reflections and refractions, and provides underwater views of the surface. The third component, Air Optics, is a Universe shader used for the creation of sky and atmospheric effects such as rainbows, haze and sunsets. Arete has also announced the release of version 3.5 of its *Digital Nature Tools* package for *Softimage 3D|Extreme*.

Psunami 2.0 costs $499, or $149 as an upgrade. See the site below.
CONTACT: www.northernlightsprod.com

WILDCAT RELEASED INTO EUROPE

The Wildcat II 5110 graphics card from 3DLabs, reviewed in the last issue of *3D World*, is to be sold through local system integrators and OEMs in Europe. It's the first time Wildcat technology has been made available in this way, and is a response to pent-up demand for the cards in the European market.
CONTACT: www.3dlabs.com

422 USES INKWORKS

422's Manchester-based multimedia studio has recently completed a couple of projects which incorporated Cambridge's *Inkworks for Maya* software. The first, an ad for Accident Group, features a clumsy character called Mr T whose bad luck leaves a trail of chaos in his wake. It should be stressed that the accident-prone Mr T bears no resemblance to the screen star of the same name, immortalised by his aggressive performances as BA Baracus in *The A-Team* – one is a soldier of fortune, the other a victim of misfortune – and in the advert there's not a gold chain or surly catchphrase in sight.

The traditional cartoon look required by the client, Equinox was achieved in *Maya* by using *Inkworks* to draw outlines on the character, which was modelled and animated in Alias|Wavefront's package beforehand. The technique was carried over to another 422 commission, to provide the title sequence for Voom's *I Love the '80s*. Director, Andy Frith filmed live-action shots of people in 1980s' regalia, rotoscoped them to create an outline illustration style, then composited them into 3D environments painted with *Inkworks*. "The ink lines proved to be very robust, providing a clean solution to achieving the desired look," said 422's animator, Darren Oakes. The project, which involved rotoscoping 650 frames of animation and completion of plenty of 3D aspects, was conceptualised and completed within a fortnight.

CONTACT: www.422.com

Naked girls in the sky

Framestore's ad for gas pays homage to a Disney classic

Advertising gas can't be a particularly easy task, since you can't even see it. Framestore's 3D department sidestepped the problem by creating a *Bedknobs and Broomsticks*-esque parade of household objects flying across the sky to illustrate a return to British Gas. Framestore's new *Virtual Camera System* proprietary software was used to create a 3D previsualisation, with Framestore claiming that its 3D camera offers far more flexibility and precision than a motion-control camera, enabling the company to take into account the speed and manouverability limitations of motion-control moves. The *VCS* allowed Framestore to place CG versions of all elements of the advertisement to be placed into shots, whether they were locked off or moving, for an accurate pre-vis.

At one point in the proceedings, a squadron of bathing women flies over the main character's head. The baths were created in 3D and combined with motion-control green-screen footage of the bathers during compositing in *inferno*, part of the extensive post-production process Framestore undertook to grade the footage, add shadows and combine elements, many of which consist of hundreds of layers.

CONTACT: www.framestore.co.uk

The sky shots for Framestore's ad for British Gas were shot on location in South Africa and enhanced using *Spirit*. A final sunset shot was created in *inferno*. Still no sign of Mary Poppins, though.

DREAMWORKS ACQUIRES PRATCHETT TRILOGY

With over 23 million copies of his books sold worldwide, Terry Pratchett is one of the most successful authors ever, with each new release in his *Discworld* series catapulted to number one by his loyal following. DreamWorks, the company behind forthcoming animated feature *Shrek*, has acquired the rights to Pratchett's Bromeliad trilogy of fantasy novels: *Truckers*, *Diggers* and *Wings*, and plans to turn the first of these into an animated feature under the guidance of *Shrek* director, Andrew Adamson and one of *Shrek's* co-writers, the inappropriately named Joe Stillman. The trilogy tells the story of a group of creatures called nomes who live in a department store but find out their true alien origins when their home is demolished. "Terry Pratchett is an incredibly clever and imaginative writer, and I was drawn into the world of the Bromeliad," says Adamson. "It's a story that lends itself extremely well to being a film, and I immediately wanted to be part of its telling." Keep an eye on the Web site below for further info.

CONTACT: www.dreamworks.com

Rev your engine

Display developments set to supercharge game graphics

New 3D display technology resulting from the alliance between Criterion Software, maker of *RenderWare*, and Hybrid Holding, maker of *SurRender 3D*, promises to dramatically increase graphical realism for next-generation games developers. The new *RenderWare dynamic VPS* technology, or *dVPS*, rapidly and dynamically determines which objects to draw, freeing developers from the limitations of the pre-processed visibility data process. In the past, this approach has meant handling dynamic environments with more than a few special-case moving objects, which has been beyond the means of consoles and PCs. With *dVPS* however, its creators claim that richer, larger and more immersive 3D worlds can be created, with a near-unlimited amount of objects.
CONTACT: www.hybrid.fi and www.csi.com

LEAF AWARDS ENTRIES

The London Effects and Animation Festival is now accepting entries for animations across a number of genres. The categories are Commercials: Animation (the use of CG to promote); Commercials: live-action effects (the best mix of live action and CG); Feature Films (CG in full-length productions, but entries must be edited to no more than 10 minutes); Pop Promos; Short Films; Games Titles; Web Animation, and Student Work. The deadline for entries is 21 September 2001, and they will be judged by a panel of industry experts from Aldis Animation, DreamWorks, VTR and Glassworks, amongst others. For more information, contact Sophie Trainor on +44 (0)20 8987 0941 or visit the Web site below.
CONTACT: www.digmedia.co.uk/leafawards
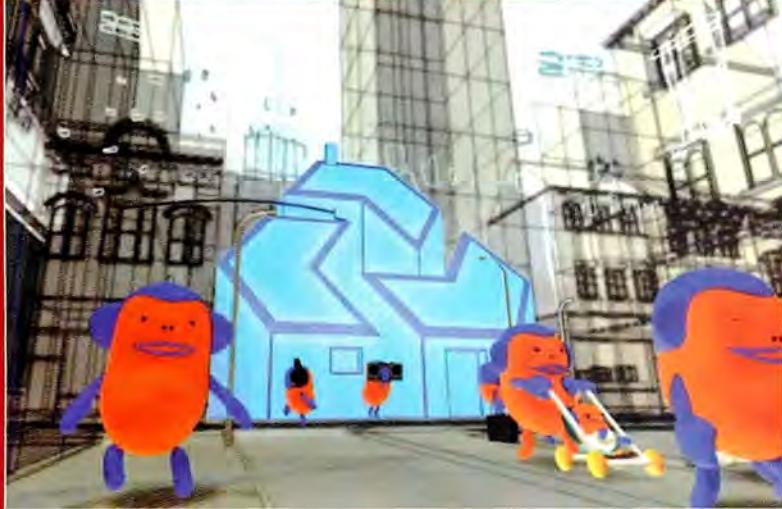
Last year's aquatic-themed LEAF Award winners included *Fishing Line*, an ad for NatWest created by AKA Pizazz, and a promo featuring surfing cartoon camels, created for premier Welsh neu-psychedelia merchants, Super Furry Animals by Clear Ltd.

web 3d

VIRTUE 3D AND SOLIDWORKS

The SolidWorks Corporation has integrated *Virtue3D* into its *SolidWorks 3D Instant Web Site* CAD tool. Users can upload design data to a secure site for others to access the model. *Virtue3D* compression assists the process by producing files less than 5% of their original size. For more information, see the site below.
CONTACT:
www.virtue3d.com

CYBELIUS RELEASES I3DI

Conductor i3Di from Cybelius is the most recent solution for collaborative 3D viewing and manipulation of models to join *Reality Wave* in the marketplace. The new software, consisting of *Conductor i3Di* as an interactive 3D interface and *Sharemore* for collaboration, can be used for a variety of applications including collaborative design, training, tutoring customers in the use of a product and teaching using complex objects. *Conductor i3Di* works by downloading an applet to all participants, allowing them to interact with, animate and modify database-driven models. The software supports one-to-one as well as one-to-many interactions.
CONTACT:
www.cybelius.com

MAYA SHOCKWAVE EXPORTER

Web designers can now export *Maya* scene cameras, lights, geometry and shaders directly to *Director 8.5 Shockwave Studio*, thanks to a new plug-in which is downloadable for free from the Web site below. The *Maya Shockwave 3D Exporter* plug-in consists of the *Maya* RT Scene Checker to optimise *Maya* scenes, and the *Maya* RT Export Express which facilitates fine-tuning of content. The plug-in is currently available as a Beta version for PC, though a Mac version is also promised in the near future.
CONTACT:
www.aliaswavefront.com

IMMATURE ROBOT WOOS CHILDREN

Channel 5 in the UK has increased its output of programmes containing 3D, receiving rave reviews from its younger audience and doubling the ratings of the slot in which it appeared in the process. The station recently aired *Roli Poli Olie*, a remake of a cartoon short series from the 1930s which chronicles the growing pains of a young robot. The new version was produced by Canadian company Nelvana and has won numerous awards including a Gemini for Best Animated Programme and two Daytime Emmy awards. Spurred on by its success, Channel 5 is also debuting its fully animated series, *Excalibur from Ellipse*, which is due to air mid-September.

Nick Wilson, controller of Channel 5's childrens' output, believes broadcast 3D animation is moving away from the stereotype he describes as cold characters with stilted movement working against B-movie sci-fi backgrounds. "With series such as *Roli Poli Olie*, top-line production companies are creating warm, imaginative stories with charming, lovable characters. As with any other genre, 3D will not suit every story or idea, but where it is appropriate and in the hands of professional and imaginative producers, it is an exciting area to be involved in," says Nick.
CONTACT: www.channel5.co.uk

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FLYING START

You've done a showreel, you've made your way at a succession of big-name companies and in some high-profile projects. Now it's time to break out on your own – and here's where you learn how

BY BEN VOST

Nepotistic, incestuous, cyclic. All these words describe the CG industry to a 'T'. The same people change jobs with the regularity of a Swiss movement, and companies pay ever-increasing salaries in the vain hope that their star animator, TD or whatever won't move on to pastures new. Newcomers to the industry find it hard to decide which of the packages that they can't afford they should concentrate on learning, and struggle to get their showreels even viewed by bored senior staff at established companies who've seen it all before.

ALTERNATIVE VIEWPOINT

There is an alternative, of course. Provided you have enough confidence in your own ability, and/or a nice, large contacts list; you can set out on your own. People don't have to see the kind of world you inhabit – in these days of fat pipes and persistent Internet connections your home base could be in the Bahamas – bedroom artists are back in with a chance against global corporations.

Even with the talent required to get work in 3D, having the ability to talk to companies and individuals to get that work requires you to be more than just an accomplished artist. In these multi-tasking days, you'll also have to have a facility for selling to dubious potential customers, the ability to account for your expenditures to your accountant and the discipline to work while the sun shines brightly through your window (and the moon, come to that). You shouldn't be ashamed to take on flying logo work. As one freelance artist once told me, it's the single most lucrative animation work you can do and while the general public aren't savvy to just what is possible in 3D, they can be impressed by a standard chrome surface and regular motion paths. 10 minutes work, a cheque for a grand, thank you very much.

In the following pages we'll look at a series of start-up projects, from a plug-in coder to Oscar winner, Rob Harvey and see how they've managed to strike out alone. Along the bottom of all the pages are a series of comments from CG luminaries the world over. Read on.

3D World asked a group of 3D professionals what they thought were the most important things about setting up a 3D company. The questions we asked were:

[01] What would your advice be for anyone starting a company in the 3D/games industry?

[02] Is this a good or bad time to be looking at starting a 3D studio?

[03] How do you see the 3D industry changing over the next five years?

Here's what they had to say:

rust boy

This ferrous fairytale is the brainchild of Scottish-based digital artist Brian Taylor, whose investment in an online work-in-progress diary is beginning to pay dividends   BY OWEN BAILEY

XL5's *Rustboy* is a Frankensteinian short film at the very earliest stages of development. In fact, it's so embryonic that its creator is unwilling to release anything but the vaguest of summaries about it, lest the creature's progress in the outside world is jeopardised. However, the moral of the tale, from a producer's perspective at least, is abundantly clear. "The most important advice I could give anyone these days is get yourself out there on the Internet," says Brian Taylor, the animator behind *Rustboy* and one-man design company, XL5. "What other way could a guy sitting in his spare bedroom in Scotland possibly hope to achieve what I have managed in a matter of weeks with no budget whatsoever?"

Since uploading his Web site and showcasing *Rustboy,* Brian Taylor's cinematic short has attracted industry-wide intrigue. The list of enthusiasts voicing their approval for his startling imagery is so imposing that he has become self-conscious about name-dropping them, maintaining that his original plans for *Rustboy* still stand – to create as good a short film as possible with the resources at hand. "I've had e-mails from the co-director of *Final Fantasy,* who mentioned his next project briefly and asked if I would be interested; the Farscape team at Animal Logic; various people from Blue Sky Studios; Centropolis FX; Jim Henson's Creature Shop CG; *Episode One* designer Doug Chiang; various people from Pixar; a matte painter on *Lord of the Rings,* the list goes on," he says.

HOT UNDER THE COLLAR

So what is it that's getting such a respectable list of luminaries so hot under the collar? The first thing that springs to mind is the refined, cinematic photo-realism of the imagery, the obvious craft and technical prowess that has gone into creating the tantalising crop of *QuickTime* clips on the site. Brian's ability as a designer is not open to question in this

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NAME Paul Franklin
JOB TITLE Head of Computer Graphics
COMPANY Double Negative VFX
EMPLOYEES 65
WEB www.dneg.com

[01] My advice is to invest time and effort in getting the right people rather than worrying too much about the right technology. Good people can do great things with very little,

super software can't do anything on its own.

[02] It's always a good time if you've aimed yourself in the right direction –

the Mill started up in the middle of a bad recession in 1990 and was a success pretty much from the very beginning.

[03] In Film and TV we're going to see a whole new generation of directors who are totally at home with the new technology, at the same time there'll be more CG people who really

THIS SPREAD *Rustboy* tells the tale of a boy who is accidentally brought into a world which seems exciting but loses its appeal. The environments he travels through vary from supernatural darkness to outside locations, and keeping the look consistent has been one of the main challenges for the film's creator, Brian Taylor.

SINCE UPLOADING HIS WEB SITE AND SHOWCASING RUSTBOY, BRIAN TAYLOR'S CINEMATIC SHORT HAS ATTRACTED INDUSTRY-WIDE INTRIGUE

respect, since he's already won awards for interactive pieces that he's produced. *Rustboy* began life as a *Photoshop* illustration and Brian makes a living freelancing for design and advertising agencies in Scotland as well as having a track record that includes working with state-of-the-art 3D software. But *Rustboy's* visuals are made all the more impressive from a technical viewpoint by Brian's pledge to use *Infini-D* and *Photoshop*. It's a decision which, if not exactly a vow, then at least speaks of an artistic pride in using software that's supposedly beneath the professional 3D artist to produce some of the most accomplished budget 3D yet to grace a pop-up window. "I wouldn't say I've found it restrictive so far," he considers. "The challenge of creating something using basic tools forces you to come up with ways of getting round problems, which in turn gives your work a bit more of a unique look. Whenever I come across a piece of software that makes it too easy to achieve a cool effect by just pressing a couple of buttons, my first reaction is forget it, because if I can press a couple of buttons, so can anyone else."

This unique look is one nourished by a celluloid diet consisting of Tim Burton, Jeunet and Caro and Ridley Scott, with a retrospective nod to Ray Harryhausen, old Disney and the sinister shadowplay of the expressionist Cabinet of Dr Caligari along the way. In direct contrast to the mad scientist Steampunk look of his character and dramatic rococo settings of his sequences, Brian's
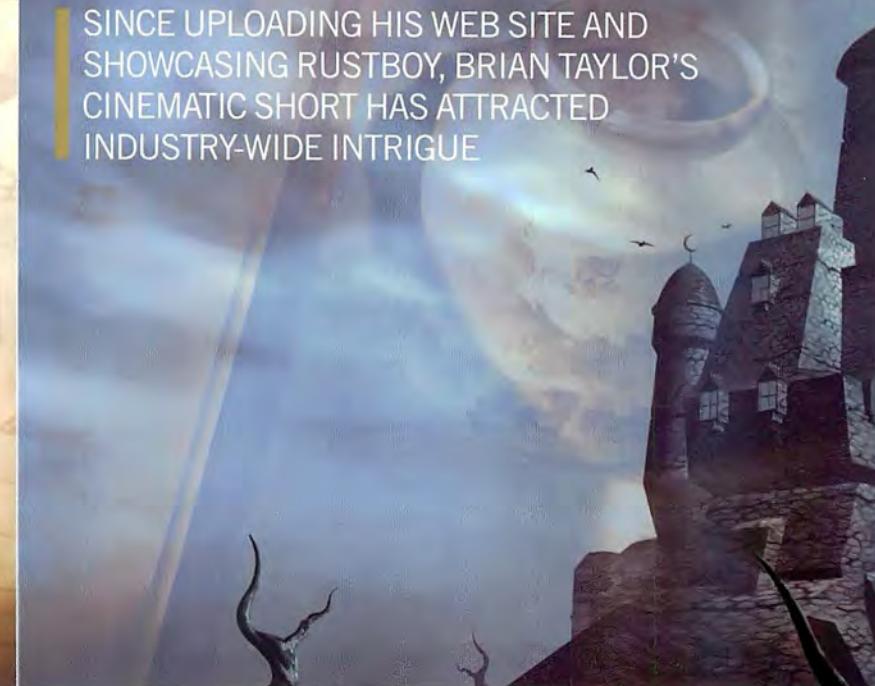
understand how to integrate. This might lead to a totally new language of cinema that will blow away even the best VFX that we've seen to date.

NAME Joerg Liebold
JOB TITLE Head of 3D Department
COMPANY Das Werk GmbH
EMPLOYEES 60
WEB www.daswerk.de

[01] I have no comment.

[02] A good time, because 3D computer animation is growing up.

[03] More character animation and 3D animation jobs in film, games and advertising industries.

eye is not informed by any formal training in the esoteric arts of cinematography. "Whenever I see anything I like, no matter how small or insignificant it might seem, I just seem to store it in the back of my mind for possible use at a later date," he says. "It's not a conscious effort or anything, but it just kind of happens, and I find that *Infini-D* is perfectly capable of reproducing my vision on-screen."

RUST NEVER SLEEPS

Rustboy may feature an isolated and despairing toy robot, but it isn't without its suitors in the real world. A Canadian TV production company recently declared interest in turning the short into a series, and though Brian felt that, at a mere two weeks online, the project was not ripe enough for such a commitment, he hasn't dismissed the possibility out of hand. Companies have offered various beta versions of software in exchange for using it as promo material, and freelance work has also been offered on the strength of the site.

Even as we go to press, there is talk of a major development underway, which also remains under wraps. Such commercial momentum could tempt many entrepreneurs to transform XL5 into a full-time 3D concern, but Brian's masterplan is far from that. "Absolutely not, my experience has taught me that
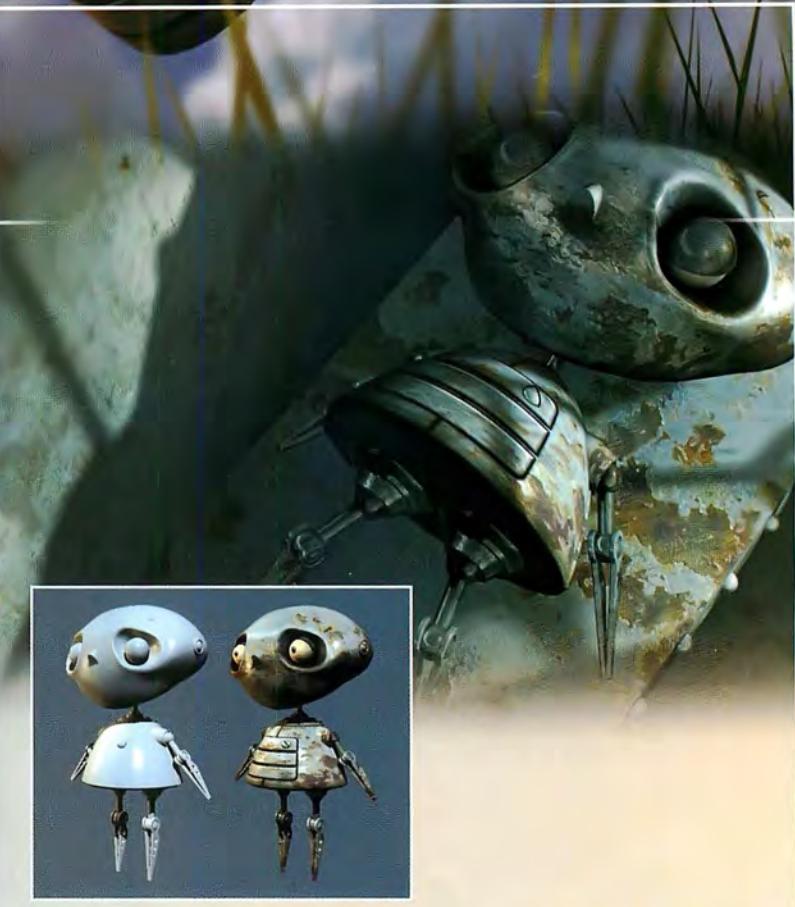
NAME Ben Smith
JOB TITLE 3D Director
COMPANY Stormfront Digital Pictures
EMPLOYEES One
WEB www.sfdp.co.uk

[01] Take a good look at what your company is going to offer over your competitors that makes you different. If the answer is 'we'll be cheaper' then think again. There are so many outfits offering low-cost services, it's only going to get harder to make a living.

[02] It's certainly a good time to be in business with 3D graphics. It's a growth industry, and there are new media and new opportunities arising all the time.

[03] If I knew I wouldn't tell you!

NAME Frank Vitale
JOB TITLE Digital Artist
COMPANY Freelance
EMPLOYEES N/A
WEB www.vitalef.com

RUSTBOY'S SUCCESS DEMONSTRATES THAT THERE ARE RICH PICKINGS OUT THERE FOR INDEPENDENT 3D TALENT, ESPECIALLY WHEN SHOWCASED IN THE RIGHT WAY

RUST WEB

THE RUSTBOY PROJECT IS ENTWINED WITH THE WEB, and Brian intends to premiere the film online when complete. Its corresponding Web site is not only an extremely fine example of site design in its own right, but has plenty of insight into the 3D specifics of texturing and surfacing, examples of the character's origins and development, even its walk cycle. The diary section, providing a conceptual, technical and commercial progress report, has proved to be an unexpected crowd-pleaser.

"I didn't expect to devote so much time to its upkeep at all at first, but when you've got a few thousand people a day expecting something of you, it's kind of hard to ignore them and go and watch TV instead," he says, adding his explanation of the interest it has conjured. "I think it reassures people that it's a live, on-going project, and somehow that makes them feel a part of it. So even if I'm too busy to work on *Rustboy* at all in a particular week, as long as I explain this in the diary people are fine with that. If the diary wasn't there, I think people would be much less inclined to revisit the site."
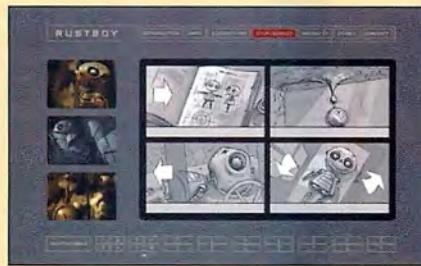
[01] Don't skimp on design. Have a dedicated staff that does nothing but design, that is pencil and marker to paper design. If you have tight designs then the job of your modellers and texture mappers is much easier and much time will be saved.

[02] I don't think there is a bad time. There is more and more 3D every day. If you have a talented team and you know how to market yourself then any time is a good time.

[03] The mediocre studios will fade away and the true talented ones will rise to the surface. The marriage of technical know-how and artistic expression will become tighter and you'll start to see more superprojects such as *Shrek*. People will demand superb quality. It's all about vision – you have to have vision.

THIS PAGE
By definition, *Rustboy's* surfaces are important to the character's realism. Each has a corresponding greyscale map used for texture and reflection mapping.

whenever I start getting involved in a business, that's when the problems start. This is a purely personal thing, but I feel the need to stay small and independent," he says.

Rustboy's success demonstrates that there are rich pickings out there for independent 3D talent, especially when showcased in the right way, but Brian ultimately regards his 3D talent as a process, a means to an end. "The climate is always right for a good idea, whether it be 3D, 2D, digital or traditional," he says. "In the case of *Rustboy*, the majority of people who contact me simply see a film that they like, a character they like – which is exactly the way it should be."

3D

Visit Brian's *Rustboy* project site at **www.rustboy.com** for regular updates on his 3D techniques, and look out for clips from his short. For further info on his other projects, visit **www.xl5design.com**

INFINI-D LIGHT

A POKE AROUND THE RUSTBOY WEB SITE reveals a breakdown of the ingenious methods Brian has used to persuade *Infini-D* to convey the heightened sense of drama and atmosphere in the short. A prime example, covered in a mini-tutorial on the Web site, is his use of multi-layered *Infini-D* renders with different degrees of blurring applied to selected elements in *Photoshop* to create a depth-of-field effect. When on the payroll for a 3D company in Scotland, he used to sneak off to use *Infini-D* in preference to top-of-the-line apps at the time because he could get a better-looking job out of it in a fraction of the time. "I've used it for so many years now, and know it inside out, which is liberating in the sense that I don't have to think about the technical aspects of the job and can concentrate on the creative aspects," he says, yet is even-handed in his criticism, describing its modelling capabilities as a let-down. "But it's easy to do certain modelling jobs elsewhere and import them, and I'm not too big on modelling anyway and try to get the feel over with lighting and textures, so it's not really a problem."

NAME Christopher 'Flay' Stewart
JOB TITLE Character/VFX Artist
COMPANY Freelance
EMPLOYEES N/A
WEB Web: www.flay.com

[01] Make friends and keep them. This applies to everybody from your employees and other companies to your financiers. A large part of the industry depends on personal relationships and,

whether you're a small VFX firm or a large game company, you'll live by them.

[02] Prepare to be competitive, as the glory days of huge payouts for little

work are gone. Even the small shops can produce sophisticated work now and will undercut the larger shops in price (as they did with DTP and DTV).

[03] Faster, cheaper, better. Cost-wise, you can place a consumer 'gaming' rig beside a 'massive workstation' purchased a short time ago and the blighter will run rings around that 10

01

02

POOJYUM

[01] The animator drags the Titan slider to time the animation in the range (0, 30). If he drags fast, the animation becomes faster.

[02] Using the Frames Browser and the Frames List, the animator can intuitively select the keyframes he wants to keep and discard the rest.

[03] Using the Sessions Editor, the animator can compare, restore, re-arrange and discard the edited animation in each session in real-time.

03

Sampath Jagannathan relives the various rigours of developing *Titan*, a promising new animation timing and mo-cap editing plug-in for Maya   BY OWEN BAILEY

S potting a gap in the market or the need for a new product is one thing, working out how to create the solution while keeping your head above water is quite another – especially if you're using the wife's savings to fund your endeavours. Sampath Jagannathan, a London-based developer trading under the name of Poojyum, has managed to perform this delicate balancing act between domestic tranquillity and intensive programming for the best part of a year-and-a-half. "I would have thrown in the towel but my wife wouldn't let me," Sampath explains. "She'd remind me that I was developing something fresh that had the potential to reach animators in every corner of the world."

These philanthropic motives alone don't pay the bills, however, and faith in *Titan's* capabilities, introduced in the boxouts on these pages, was backed up by a mix of shrewd business practice and dedication to duty. Sampath's background in graphics programming started in 1994 when he wrote an image-morphing plug-in for *Autodesk Animator Pro*, which led to experimentation with explosion systems using IRIS GL, the predecessor to OpenGL. His own excursions into animation made him realise just how tricky it is to get started, which has led to an abiding respect for the craft and which eventually persuaded him to take the plunge and invest his savings in the Alias|Wavefront *Conductors* program, an initiative which provides developers with labour-saving products, tools and macros. "Independent programmers aiming to be self-sufficient won't compete with the big companies. They'll carve a niche for themselves to survive comfortably," he says. "Big companies may lose some market share to these developers, but not enough to rock their boat."

The nature of developing proprietory software of this kind, coupled with the accessibility and minimal overheads of Internet business, means that time is the only real debt that's incurred. "Most R&D can be done with pen, paper and a

FACTFILE

BASED London

WEB www.poojyum.com

CONTACT jagan@poojyum.com

BACKGROUND Poojyum is a new company developing plug-ins for 3D software

meagre brain. For *Titan*, my R&D costs were £3.98 – £1.99 for a notebook and another £1.99 for a felt-tip pen." Sounds like he was ripped off for the pen, but *Titan's* universal appeal to animators, reinforced by overwhelmingly positive feedback from the studios and animators that have taken it out for a spin so far, puts the sleepless nights poring over the 15,000 lines of code and scripting that went into *Titan* in a more encouraging light.

Sampath himself is content to stay independent, providing his project makes enough to fund his next project. "My aim with Poojyum is to continue writing programs like a writer writes novels," he says. "But I would love to write programs from the top of a mountain one day."

grand paperweight. However, one piece of software still costs more than a good workstation (or two). Expect the low-end to keep pushing the high-end prices down. If all the money they're pouring

into it has its way, the Web will become a method of delivery for (proper) 3D content. Something to keep an eye on, especially those in games, proficient at working with minimal resources.

NAME Andy Miller
JOB TITLE Editor
COMPANY 3D Festival Community
EMPLOYEES Nine
WEB www.3dfestival.com

[01] First and foremost, have a clear idea of what you are offering. Many small companies have gone down because they were too diffuse in the services they were offering. Focus is

the key. Second, spend time doing research, both about your client-base and the competition. Third, write a full business plan and then do a 'What if?' disaster scenario.

THIS SPREAD Simon Hodgekiss modelled this experimental shot as a test for the forthcoming 3D incarnation of *The Journal of Edwin Carp* from Bazley Films. The 2D images that surround it are taken from the first film, which Richard Bazley created using *Flash* and based on the original hand-drawn storyboard images.

bazley FILMS
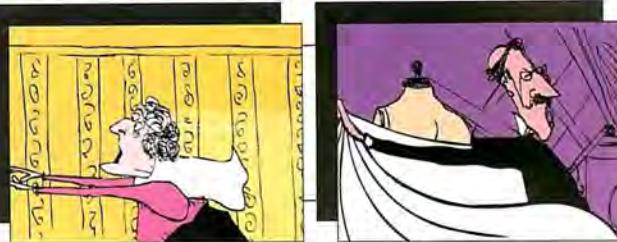
From *Iron Giant* to sleeping giant – fresh from Hollywood's animation empire, Richard Bazley's new start-up has a battleplan for expansion and some good advice for newcomers

BY OWEN BAILEY

Ex-Disney animator, Richard Bazley is sitting in a sparsely furnished room on an old WŞest country army barracks, surrounded by boxes full of videos, CDs and crumpled paperwork. Has he gone bananas? No. These are in fact the tell-tale signs of an animator feathering his nest, and that nest is Bazley Films, his new animation venture.

Richard recently traded the sunshine and glamour of Los Angeles for the predominantly rainy skies over Corsham Media Park in the English countryside, turning down the opportunity

> **RICHARD REGARDS A DATABASE BRISTLING WITH CONTACTS AS A UNIQUE BUSINESS ADVANTAGE**

to embellish his CV with yet another high-profile project – a CG version of *Spiderman* – in the process. Despite leaving with little more than his short film, *The Journal of Edwin Carp* (see boxout) and a laptop for company, he believes the time is right to make the move. "It's now far easier to put certain projects together, like the *Journal of Edwin Carp* short, more cost-effectively and professionally than ever before because of all the packages available to you," Richard says. "I'd always wanted to work with Disney as an animator and get that out of my system, but before I decided to do my own thing, I wanted to

learn all the skills of filmmaking and what it took to make a great film like *The Iron Giant* – to understand the process before I started off on my own to try and achieve the same goal."

KNOWING ME, KNOWING YOU
Aside from this technical expertise, Richard regards a database bristling with contacts as a unique business advantage, and in his case it's integral to his plans. He cites Aardman as a model, and intends to be involved with commercial work from the outset, as well as pitching for outsourced work from the major studios and working on his original projects during windows in his schedule. "I can bring in a number of freelance animators, and to keep overheads down I'm able to expand and contract the project," he says. "So, if I've got a sequence from the studios I can hire 15 animators and agree to pay them for three or four months, whatever." Boxloads of showreels littering the studio emphasise the point – follow up your contacts.

So for those without experience of pitching an original animation project to a major studio, is there such a thing as an ideal stage to do it? "It varies hugely, from a full-blown 130 page script and character design and a whole segment done – though I wouldn't recommend going that far – to a discussion and a scribble on the back of an envelope really," he explains. "Either approach can sell, depending on getting the right executive at

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Likely problems include failing to pay on time (frequent!), equipment breakdown or loss, etc. Work out a worst case and if the business plan still works, look for constructive criticism.

[02] Both. The bad side is that investor confidence is very low in IT at the moment. On the good side, I believe there will be an explosion of 3D on the Net, so if you are working on

e-commerce, e-marketing, online catalogues, e-learning and online entertainment, then the opportunities are probably better than in other areas.

[03] In terms of Web 3D, two or three key technologies will dominate. A Graphic Description Language, similar to PostScript in printing, will become the standard for some areas where a lot

of technical data need to be included. 3D asset trading will become a major part of the industry – just think of all those 2D image libraries! Avatars will become serious communication tools.

THE JOURNAL OF EDWIN CARP

BAZLEY FILMS' FIRST PRODUCTION, and Richard Bazley's directorial debut, is a *Flash* animation entitled *The Journal of Edwin Carp.* Based on the 1954 book of the same name written by the late actor Richard Haydn, it tells the story of an idiosyncratic English gent and his eccentric exploits. The book was illustrated by the legendary Ronald Searle, and Richard Bazley's own take captures the spirit of the his line-drawn style using Macromedia's *Flash.* However, the sequel to *Edwin Carp,* currently in pre-production, is to be a line-rendered 3D creation that will use Cambridge Animation's Inkworks system together with *Maya,* a system Richard used when he animated and supervised the CG for Drix, a character in Warner Brothers' forthcoming film *Osmosis Jones.* Test animations feature elements of motion capture, and Richard has ambitious plans for the short film's 3D environment, which can't yet be revealed.

The initial *Flash* short was narrated by Hugh Laurie, who agreed to do the project on the strength of a script and storyboard featuring Richard's own voiceover and some colour tests. Once the narration was recorded, Richard matched the animation to the dialogue, which he was able to do because there was no lip-synching involved. *The Journal of Edwin Carp* will shortly be featured in the festival programme, and is featured in the *Flash 5 Bible.*

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the right time and moment and whether it fits in with their strategy. I wish it was just about having a fantastic idea or story. There's a whole other agenda."

SHOW ME THE MONEY

When it comes to funding for a project, the quaint cliché of the introverted animator should be the first thing to go; according to Richard, get as many breaks as you can, secure sponsorships, form alliances with people and network is the mantra. "There are different levels. Disney is the ultimate self-marketing machine, but PR is important. Unless you get out there and put yourself about it doesn't make a blind bit of difference how good your film is," he says. Bazley Film's first product, *The Journal of Edwin Carp,* was a 2D *Flash* short sponsored in part by Wacom and Macromedia, and Richard expects the forthcoming 3D sequel will also benefit from some sort of sponsorship. Funding can come from the least orthodox of sources, and as far as Richard is concerned, it's best to cast your net high and wide, considering European funds, government initiatives, even those of other countries. Animation also has a timeless quality which can be capitalised on by the ambitious start-up.

"You can target individual investors who'll be inclined to do something a little bit unique like animation because they liked it as a child or whatever," he suggests. "If you asked them to invest in the latest vacuum cleaner, they might not be so interested, but an animated feature has a charm and interest."

Another approach to attracting investors is of course to win acclaim with your shorts. Richard cites John Lasseter's *Luxo Jr* and *Tin Toy* and Nick Park's *A Grand Day Out* and *The Wrong Trousers* as perfect examples of the route to success he hopes to follow, with a feature-length animation the ultimate goal.

Although he acknowledges that starting up a business without some of the advantages Bazley Films enjoys is likely to be hard work, he retains his faith in the sense of discovery that leads people to produce outstanding work in the first place. "The way is to get a product together as effectively as you can and then start getting it out there," he says. "Oil rises to the surface, and it will come through in the end."

NAME Mairi Welman
JOB TITLE Director of Communications
COMPANY Mainframe Entertainment, Inc
EMPLOYEES 350
WEB www.mainframe.ca

[01] Don't spread your talents too thinly – and put the talent in the right place. Don't have your creatives running the accounting or business affairs end of things and vice versa.

[02] The landscape certainly has changed over the last four years. Studios in the US are folding or spinning off into other businesses at this time. But if you have a good

solid business model, and this goes for any business, there's no reason why you shouldn't start a company now and do well at it.

[03] It's a cyclical industry just like any other. Right now, this minute, it is in a downturn, but that's a Hollywood business community reaction to big-budget fx movies.

LOLa POST

Starting up is hard to do, even with an Oscar winner onboard. So how did this London-based company find its feet in the competitive 3D market? **BY ANDY STOUT**

due to the plummeting cost of kit over the past couple of years, setting up on your own has probably never been as easy financially as it is in 2001. Getting a client base, keeping it, finding talented staff, decent premises and all the other components that go to make up a successful business remains as challenging as ever.

Paying for the equipment, though, is far more simple. Lola Post co-founder Grahame Andrew recalls spending £750K while working at Cell on *flame* when it first came out. Lola's current *flame*, bought last year, cost a relatively inexpensive £200K, and its three *Softimage|XSI* seats were put together for well under £10K each.

Given those figures, it's not surprising that the boutique facility is one of the main growth areas in the 3D industry, and there's an increasing trend for employees to bail out of their jobs with big companies and set up on their own. Lola is one of the prime examples. Set up by Andrew and Oscar

FACTFILE

FORMED November 2000

EMPLOYEES Four

BASED Great Portland St, London

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CONTACT info@lola-post.co.uk

BACKGROUND Twinings *One;* Thorpe Park *Detonator, Vortex* and *Zodia*

winner Rob Harvey (awarded for his work on *Gladiator*), both were driving forces behind the establishment of Mill Film as a world-class effects house, before leaving the company just as *Gladiator* was wrapping up and heading back into the world of commercials production.

The mechanics of how they did it are interesting. While they considered acquiring venture capital to start the business, they were unhappy with the large chunk of the company that the venture capitalists wanted in return (between 40 and 50 per cent). Therefore, and with London property prices being what they are, they raised the £400K approximate start-up cost against their own houses.

EASY? NOT A BIT OF IT

"All the books say that what you need is a business plan and I completely concur with that," says Andrew. "You head off into a great big world of debt, you're haemorrhaging money at some stages and what you really need to know is that it's part of the plan – that although you're losing all this money at the moment, as long as you stick to this plan then everything will be fine. That actually gives you a lot of confidence as, even though you're ridiculously overdrawn, you know that things are on target."

Several factors have helped Lola during its launch into what Andrew admits is a 'saturated market'. Andrew and Harvey's reputation within the industry is undoubtedly one of them, while another is that a key plank in the business model called for an aggressive ratecard. Then there's good will. "The other thing you find when you're starting up is who is friendly and will help you and who won't," comments Andrew.

LO-LO-LO-LO LOLA

As a case in point, Lola has just finished co-post production

> THE BOUTIQUE FACILITY IS ONE OF THE INDUSTRY'S MAIN GROWTH AREAS, AND THERE'S AN INCREASING TREND FOR EMPLOYEES TO SET UP ON THEIR OWN

It's funny, but when a regular movie does badly, they blame the director or scriptwriter or actors. But when an animated movie tanks the whole animation industry is held up for scrutiny and blamed for the failure. We'd like to change that by making top-notch TV and films in 3D animation that have a reasonable budget, and we're well on our way.

NAME Greg Uhler
JOB TITLE Producer on *Myst III: Exile*
COMPANY Presto Studios, Inc
EMPLOYEES 28
WEB www.prestostudios.com

[01] Look for some experienced people to be part of your team. They should have similar goals as the founders and experience making the type of games you want to make.

[02] The games business is growing, though publishers are taking fewer risks than ever before. So, starting your own company is very risky, but it depends on everyone's situation.
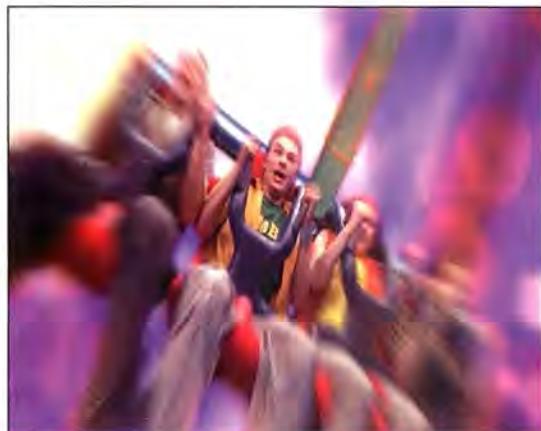
LOCATION, LOCATION, LOCATION

APPROXIMATELY A QUARTER of Lola's start-up costs has been tied up in renting premises. Central London – which is where its clients want it to be – is a nightmare when it comes to finding a building, with costs up around the £36 per-square-foot per-year mark. Andrew estimates that this tally can be dropped down to as little as £8 by moving out of town, a saving of £22,400 a year on modest 800 square-foot premises. All the same, it remains one of the most difficult parts of the start-up process.

"The problem you have when you're starting up is that no-one will take you seriously at all," he says. "You can't get premises because landlords won't rent to anyone who hasn't got a trading record, so you find yourself doing increasingly stupid things to get premises, like paying a year's rent in advance as a deposit and stuff like that."

work on a forthcoming major commercial for an extremely well-known telecommunications company with Smoke & Mirrors. This represents the company's most high-profile project yet, following on from commercials work for Twinings and Thorpe Park.

Numerous projects have also been pushed through the constantly booked *flame* suite, while persistently bubbling under has been work – both 3D and compositing – on Henson's current *Jack & The Beanstalk* production.

Even so, money remains tight. Lola has just moved to larger premises, having rewritten the business plan to absorb the additional cost, and that imposes a new set of constraints. "It's a real cashflow problem time for us," admits Andrew. "So, for example, I managed to find some fairly good second-hand operator chairs for £25 each, where most people spend about £1,000 on theirs. You have to get quite inventive with the way you do some things, calling in favours and so on. But people help you out too – and that's clients as well as peers," concludes Andrew.

FAR LEFT *Softimage|3D* work for Twinings. Andrew flits between *3D* and *XSI*. "You have to be careful what you use *XSI* for as there are some gaps in it still," he says, though he rates the interface into *mental ray* and the animation tools highly.

LEFT CENTRE A shot from the Twinings commercial, the ladybird being created in *Softimage|3D*, animated using *Multiped*, and then deformed on to the leaf.

ABOVE One of Lola's Thorpe Park commercials. Shot against bluescreen, the idea was to simulate the movement of as-yet unbuilt rides for which Lola created a full 3D animatic to guide the cameraman through the camera moves.

ABOVE RIGHT More Thorpe Park. 3D backgrounds were dropped in after the bluescreen shoot, which at one stage included, according to Andrew, 'most of Surrey'.

Andy Stout is a freelance writer specialising in the post-production and computer graphics industries, and is a regular contributor to *3D World*. Pay a visit to his Web site at **www.stout.demon.co.uk**

[03] I feel that as games require larger and larger budgets, people will become more specialised in what they do – much like employees for film and fx companies have become. But smaller companies will require well-rounded employees who can do many different tasks. I also predict that the smaller details such as cloth and hair movement will be taken care of automatically by the software that the artists are using. This will allow artists to be much more productive and will hopefully translate into more original ideas and more content for the end user.

too many hunters

The fact that there are so many 3D packages on the scene does not necessarily mean the market is healthy

BY GARRICK WEBSTER

Not long ago, I commissioned a writer to review a new 3D application. He went off to concoct a review, the opening line of which read, 'Oh great. Just what the world needs, yet another piece of 3D software'.

I can hardly say I was surprised. While there are four or five really well-known professional 3D applications out there – *3ds max, LightWave, Softimage, Maya* and *Cinema 4D* – there are heaps and heaps of other contenders waiting in the wings for their big chance. Our writer simply articulated what a lot of people are thinking.

Fair enough, several of the fringe applications out there only aim to dominate a niche in the market by doing one or two things very well, leaving the rest to someone else. The modelling area might be a good case in point. Amongst the general 3D applications, however, a feature-set rat race is going on. *Maya* version X arrives with this animation tool, and soon *Softimage* Y has something similar. *3ds max 44* comes along with new rendering options, and before long

reason for this is that in each price bracket nearly all the applications available are pretty damn good, both in terms of quality and value for money. Another writer of ours once advised a reader that it didn't matter what application they chose, only they should spend more time concentrating on getting a comfortable chair for the long hours ahead.

This being the case, I'm led to wonder exactly how developers of 3D applications actually make money. These tools are complex to program, test and debug, and due to that feature-set rat race there's constant pressure to add more to them. There are certainly a lot of 3D users out there – if there weren't, Future wouldn't publish *3D World*. But it's very doubtful there are enough to support the 20 or 30 different companies out there who are shooting at the same gaggle of geese.

Just look at other creative markets. In mainstream Web design, *Dreamweaver* is king. *Photoshop* has no real competitors in photo-manipulation. It's the best and it stays the best by being the best. So why isn't the 3D market like

ARE THERE ENOUGH USERS TO SUPPORT THE 20 OR 30 COMPANIES SHOOTING AT THE SAME GAGGLE OF GEESE?

GARRICK WEBSTER
is the editor of our sister magazine, *Computer Arts*.
www.computerarts.co.uk

Cinema 4D XL 45 is on the doorstep, also tempting us with a new roster of rendering resources. These updates are coming thick and fast, which only adds to the confusion.

And there is confusion, believe me. The single most commonly asked question I'm posed by our readers is: "Which 3D application should I buy?" The question is almost impossible to answer, and the

this? It's possible that some 3D developers are kept afloat by bigger parent companies with vested interests. For instance, someone looking to dominate in broadcast video would want to zip up the 3D graphics aspect too by offering loss-leading tools to complement their editing and effects software. Some houses exist merely as tax write-offs for bigger holding companies. Somewhere along the line, however, something has to give. The only question is: when? Drop us a line and let us know what you think.

VIEWS

To express an opinion on anything related to 3D creativity, raise an industry issue or comment on matters of editorial policy, simply send an e-mail to **3dw.views@futurenet.co.uk**

SUBJECT: NOT SO SUBTLE

I'm a big fan of your magazine, and have become a regular buyer since issue 7. I knew about *3D World* through my friend. It was issue 5, and I was amazed with what I saw – the Exhibition, the reviews and the free software – just what I've been waiting for a long time. I recently graduated from IBA & got a diploma in Architecture (Institute des Beaux Arts, situated in Lebanon). I'm very interested in the CG domain and wish to pursue my studies in this field. I know a lot about *3ds max*, so Pete Draper's tutorials received a very warm welcome. In fact, they were awesome. For study, I was aiming towards Sydney, Australia, but I can't seem to get any help out of the Net because it's not clear to me what this major is called – so I end up stuck for hours running through the courses given in any 'suspicious' major, trying to find a match.

Would you be kind enough to guide me to the universities in Sydney providing this major of study, just like the one mentioned in issue 11, situated in the UK? If possible, could you also send me the e-mail address of Aaron Ellis who's studying in Sydney and e-mailed you in issue 11? The title was Subtle Begging Letter – come to think of it, mine doesn't seem so subtle! I thank you in advance for any help you can provide, and hope you keep up your good work. It's nice to see what a pro can do.
Sami Jamal ddin (obeid_maher@hotmail.com)

I've included Sami's e-mail address for anyone wanting to tell him of a good course in Sydney, or for Aaron Ellis to contact him.

SUBJECT: HANDS ACROSS THE WATER

The Bill Fleming hand-texturing tutorial in the April issue was all well and good but the most vital part was missing. He doesn't tell us how a texture that is essentially drawn over a planar template is applied to a hand model without it streaking down the sides! Surely, in a case such as this that's destined for high-resolution rendering, each finger and thumb would be mapped separately with a cylindrical map, as would the remainder of the hand? Now, a tutorial that gives the lowdown on techniques to seamlessly blend a cylindrically mapped arm/finger/leg to a cylindrically mapped chest/hand/hip – that would be useful. How about it Bill? Anyone?
Roosterboy, via e-mail

Bill says: Actually the hand could be mapped a number of ways, but the most effective way to map a hand is with a planar map from the top and bottom, using Alpha-mapped planar projections from the sides for the sides of the hand and fingers. A cylindrical map for the fingers sounds logical but only results in pinching of the fingerprint. Pinching and stretching also occurs when you cylindrically map the hand. When striving for photorealism, Planar maps are the most ideal solution.

When using planar maps, you first make the hand one material, and then paint the map that represents the surface with the most exposure, such as the top or bottom of the hand. Then you apply the texture, which will invariably stretch down the sides. But this is resolved by projecting an Alpha-mapped texture from the sides.

GAME PIE

SUBJECT: LOW POLYS

Seeing as the computer games industry is one of the biggest users of 3D graphics (and makes more money than both film & video combined) why are there never any game-related tutorials in *3D World*? I am desperate for a job in the games industry but without any experience, I'm finding it rather hard to get anyone to even answer an e-mail. I've found learning low-poly character creation and environment creation far harder than high-poly film/TV-related 3D, not only because of the many constraints imposed but also due to the wealth of books and tutorials available for the latter (many thanks to *3D World* and your excellent work in this area). I think I've finally got my low-poly skills sorted, but how am I to know if I haven't got some kind of yardstick to measure up against? Thanks for listening and if anyone has any advice on this employment problem or would like to see some work, then please contact me.
Tom Stanton, via e-mail

Great magazine with some top creative ideas – especially for those new to 3D. Upon recently looking through the recruitment adverts in your magazine, however, I noticed that many of the computer games companies are looking for 3D modellers with experience in low-poly work. I'm sure that creating low-memory models with a low-polygon count can be achieved using polygon-reduction software, but how about running a feature on how to get the best results when directly modelling a low-polygon object such as a Lara Croft-style character? Tips on how to use texture mapping to best effect while still keeping memory low would be great as well, as most of the images you would create would take up no more than a third of the screen on a low-res PlayStation or a TV. Many thanks.
Mike Vessey
mvessey@mdseyesys.freeserve.co.uk

It's true that we haven't run anything on modelling for games yet. Expect something in coming months.

The edge of the Alpha map is feathered to blend to the map below. This technique ensures there will be no pinching, which is the result of a cylindrical map.

3D artists rarely take advantage of Alpha-mapped textures, yet they are utterly essential for creating detailed and accurately mapped textures.

SUBJECT: Q AND HAY?

While I enjoy the ins and outs of your magazine every four weeks, I have to pick a hole in one of your features, namely the Q&A section. There are two notable problems. The first is that I am an *XSI* user and you very rarely give tips for us *Softimage* monkeys. The second is that I'm dubious about the usefulness of the section at all. Wouldn't it be better for readers if they got a tutorial devoted to their application every so often, rather than just a single page of explanation of a fairly simple point?

Perhaps a news page devoted to novel things for the different packages every issue would be a better use of space? I don't know, I just think the pages at the moment are a bit boring.

Shelley Kidd, via e-mail

What do other readers think?

FROM THE 3D WORLD FORUM

SUBJECT: RESOLUTION SOLUTION

BLUEiCEbLACK: OK, I know many of you (possibly most of you) don't have to worry about this but here goes. At what resolution should I have to render an image to get good quality, up to A4 size? I recently rendered a still at 3,000 x 2,000 but it still prints blocky. What am I doing wrong here? Any suggestions would be appreciated. This is new ground for me.

Ben Vost: I guess we can answer that question since we print pictures for a living. Basically, when you render from your 3D package, nine times out of 10 it will only render at screen res (72dpi), but printers can handle much higher resolutions, particularly offset litho machines – the things that get used to output our magazine, for instance. Rendering at 3,000 x 2,000 should be enough to get reasonable-quality output on any level of printer, but you may want to change the dpi setting of the image in Photoshop *(or whatever) to something like 250dpi, to make sure that it prints properly. All full-page images in* 3D World *are at least 3K x 3K.*

3D World's forum will have moved to a new home by the time you read this. Make sure you catch up with the news at: www.futureforums.co.uk/creative_3dworld

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Texturing tips

Over the following pages, you'll find a plethora of texturing tips I've garnered over the years, collected here in one mighty salvo

BY ALEX LINDSAY
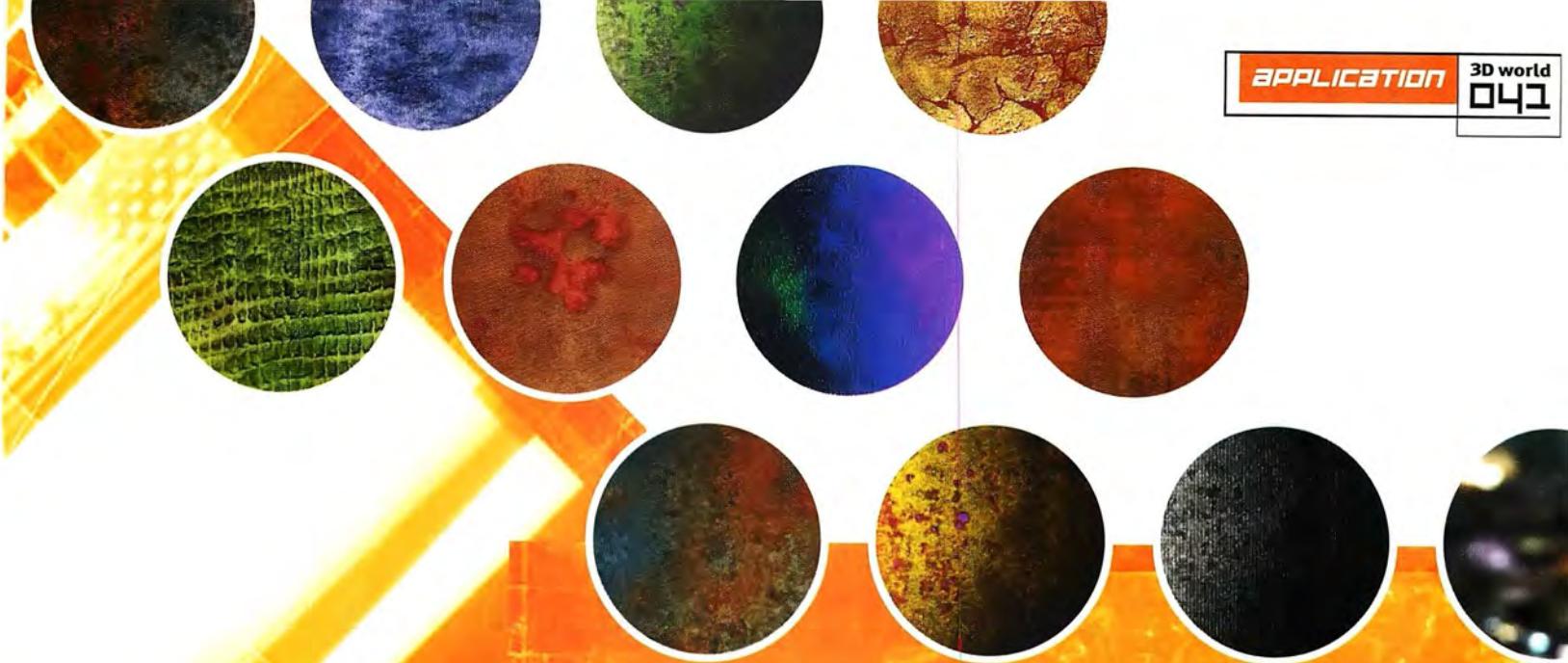
There are many books on texture maps, but rarely do they just give you the gems you need to make really great texture maps. Hopefully, the following tips will save you the hours of frustration over the years that I had to go through to accumulate them. Remember that they are tips and not rules. Everything has its own rhyme and reason.

I have broken the tips into four sections: Theory – how to think about surfacing; Shooting – how to acquire photo elements; Basics – stuff everyone should know; Advanced – where it really gets more fun.

All the images for these tips can be found on the cover CD

Alex Lindsay has spent 15 years in CG, working on movies such as *Star Wars: Episode One,* and is now employed by dvGarage. Take a look at its site at **www.dvgarage.com**
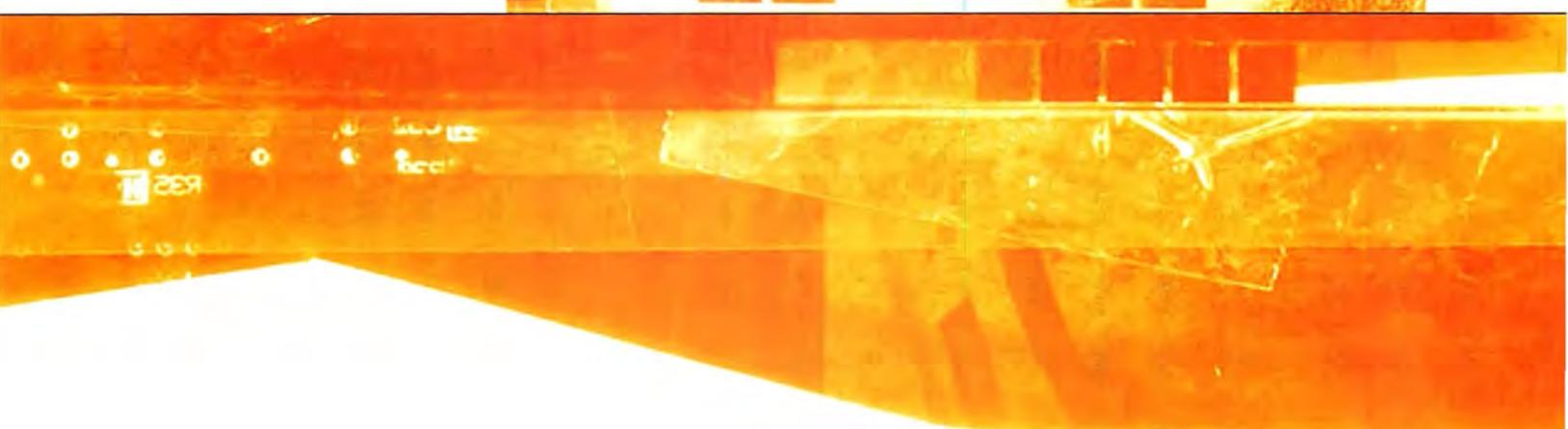
THEORY

1. PAY ATTENTION

If you do a lot of texture work, there is never a good reason to be bored. The world is your teacher. When you are waiting for your next lunch date, or a plane, or bus, take the time to explore whatever is around you. Absorbing information slowly is infinitely easier than trying to cram.

3. ADD THE UNCONSCIOUS STUFF

Most artists don't add useless elements to their texture maps, which is why you want to. Think about where you can add stickers, stains and random details that are only semi-related to the scene. This stuff exists everywhere in the real world.

4. TAKE SCALE INTO ACCOUNT

We as humans make quick decisions about what we're looking at through very subtle elements. When we see something with lots of small and intricate details, we tend to imagine scale. By creating lots of fine elements, you can actually increase the perceived size of an object.

5. USE PROCEDURAL TEXTURES WITH CARE

Procedural solutions are good but procedural textures are dangerous. 95% of the time, they look procedural and make your work look amateurish. If you're going to use procedural shaders, try to mix them with photographic elements and try to never use the default settings.

6. DO AS LITTLE BY HAND AS POSSIBLE

Try to avoid painting lots of details by hand. Face it, you consciously only see a fraction of the world and trying to paint it will reveal this fact as well as draining you of valuable time. You can build the base components by hand but always look for procedural ways to add a finish that has more detail than you can see.
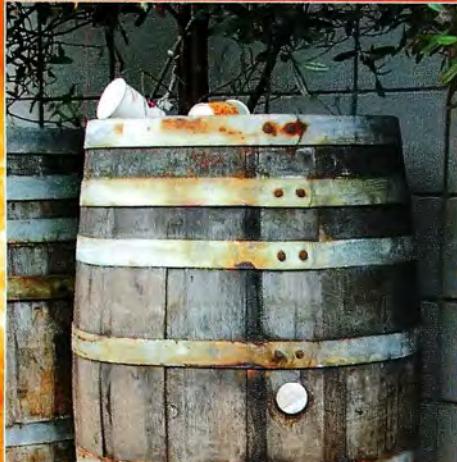
2. STUDY THE WORLD

WHEN YOU'RE THINKING about how something should look, go and find out. Or better yet, start collecting samples of the world along your daily path. Not only will you have a great library, but you'll develop a great eye. The actual process of searching for details causes your eyes to focus on things you never saw before you began. This practice will make more of a difference than almost anything else you can undertake to improve your skills. It may seem like a simple idea and not related to 3D, but that's why most people miss it. Training your fingers is easy – it's your eyes that are far more challenging.

Here's Liz, Jack, and Tom from dvGarage shooting reference images at Alcatraz.

7. WHAT'S THE HISTORY?

When you start out, think about where the object has been. Who owned it? How did it get here? Thinking about the history involved will make the process almost guide itself. You are not creating a texture, you are recreating a picture that you already see.

8. LOOK AT OBJECTS AROUND IT

Think about how surrounding objects would affect the surface you are working on. A planter will leave stains on the floor and a window will focus water and increase wear underneath.

9. LOOK AT THE ENVIRONMENT

Look at what the object has to endure. Is it inside or out? Is it in the sun or in the shade? Would passers-by hit it? All of these questions will create answers that make your next steps obvious.

10. FEW THINGS ARE 100% ANYTHING

No attribute should be 100%. Nothing in the world is pure.

11. PAINT LIGHTING

Many times, lighting a complex scene can be really difficult. Sometimes, you're making it harder than you need to. You can add soft shadowing and highlights with texture maps and save hours of manipulating lights to get exactly what you knew you wanted anyway.

12. DON'T MODEL WITH TEXTURE MAPS

Texture maps need to be subtle. You can't replace geometry with them. Think of them as the dessert, not the main course.

13. MATCH MODEL ELEMENTS

Look at what your model is doing when you're adding maps. Are the objects turning? How does object A affect object B? By looking at these details, you can bring integrity to the overall scene.

SHOOTING

14. QTVR REFLECTIONS

A little-known trick for creating great environment

maps is through *QuickTime* VR tools. If you're trying to bring an object into a live-action scene, consider using a *QTVR* rig and shooting a panorama in the place where your object will reside. You can then stitch it together and get a seamless environment that really reflects the scene.

15. SHOOT MAPS IN DIFFUSE LIGHTING

If you're shooting textures, shoot in diffuse lighting whenever possible. You will blow out details less often and you will have less grazed lighting to deal with. Once your texture is lit from a certain direction, you're committed to it in your scene.
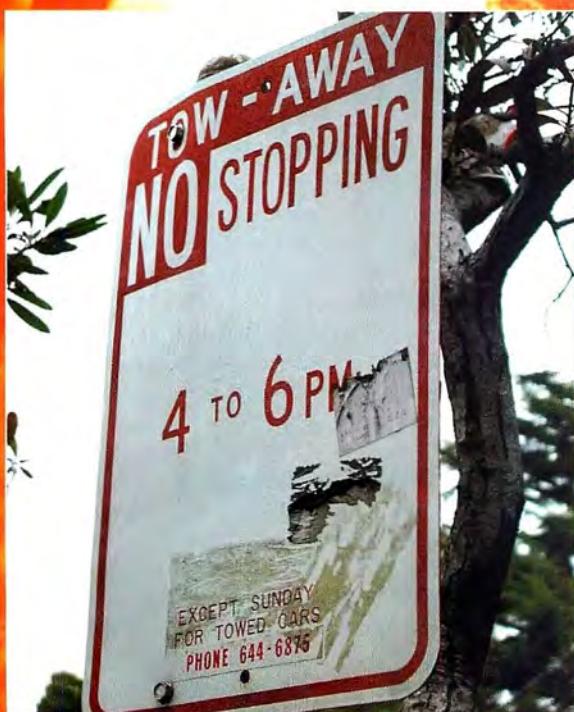
FAR LEFT: 9 The damage from the barrel on the floor and the interaction between the metal and wood are key factors needed when tying the elements together.

MIDDLE LEFT: 15 This image would make a good texture map but the hard light will make it impossible to apply in a CG scene correctly.

BELOW LEFT: 21 You want to add large details like this later, not when you shoot your maps.

LEFT: 3 It's the random damage like the scraped off stickers and layer of dust that really fill the gap of consciousness

ABOVE LEFT: 4 Two things communicate scale in this image. First, we see a trailer we can relate to. Second, we see a host of intricate details in the brick and concrete. Without the fine details, the photo would look like a collection of toys.

ABOVE RIGHT: 16 If you don't make sure your filmback is parallel to the underlying surface, you will get distortion similar to that displayed here.
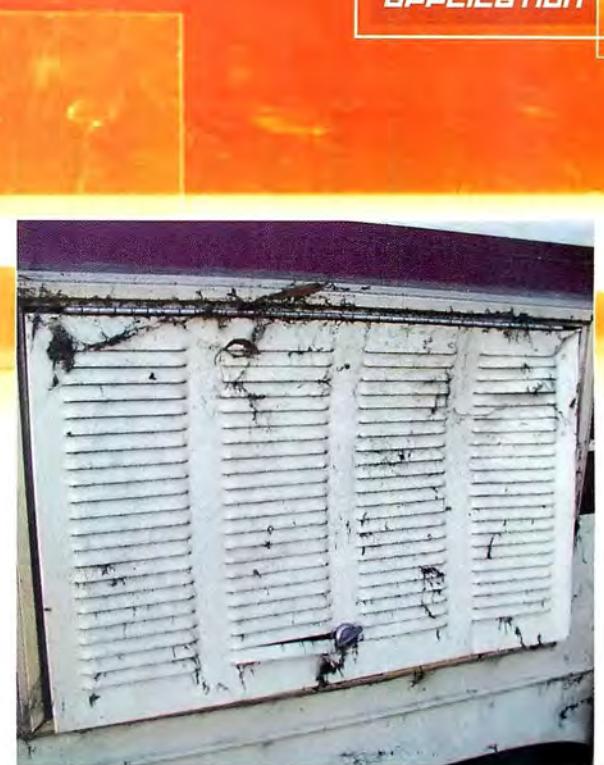
16. KEEP THE FILM PLANE PARALLEL TO SURFACE

When shooting textures, keep the film plane (or CCD plane) parallel to the surface you are shooting. If you do this, you will avoid converging lines you will have to remove later.

17. USE SLOW FILM

When you are shooting textures, if you are using film (which will still be useful for another year or two), make sure to use a slow film – nothing greater than 200 ASA. 100 ASA is preferable. The faster the film, the more grain and the harder it is to work with.

18. USE PHOTOGRAPHS

Don't paint it if you can find it. Especially when you are re-recreating reality – the level of detail required is beyond what you can often see consciously, so don't try. With the advent of 3.3 megapixel cameras, there's really no excuse.

19. APERTURE

When shooting, you want to use the smallest aperture you can get away with (which means using the highest number). Why? Because the larger the aperture, the more shallow the depth of field is. If your depth of field is too shallow, you will get blurry vignetting on the corners.

20. FILM VS DIGITAL

It comes down to whether you are going to keep your work for a long time. Film provides more resolution and greater colour depth. Digital is faster. If it's for one-time use, shoot digital. If it's for the archives, use still film.

21. LARGE DETAILS

Avoid shooting maps with significant details in the image. You will have to paint them out later because they will rarely be general enough or shaded correctly.

22. LENSES

Try to shoot textures with a long focal length. This will flatten out the distortion dramatically.

>>

23. RESOLUTION

HOW BIG SHOULD YOUR MAP BE?

This question seems to plague animators constantly. The confusion leaves them creating maps that aren't large enough to cut it or maps so large they adversely affect render times for no reason. Here's the equation: [TMS = (SPS/VPP) x 1.5] – otherwise Texture Map Size equals the Screen Pixel Size divided by the Visible Map Percentage of the map all multiplied by 1.5. Still confused? Example: If a quarter of your map will cover 400 x 400 pixels of screen space, your full map needs to be six times that (4 x 1.5) – 2,400 pixels.

By defining the final displayed pixel size of given map, we can accurately figure out how big our texture needs to be.

BASICS

24. EASY ON THE BUMP

One of the most common mistakes 3D artists make is turning their bump maps up too high. When you do this, you immediately lose scale, soften the image or cause aliasing. If you keep your bumps subtle, your object will actually look larger, sharper and more realistic.

25. SEAMLESS DOES NOT MEAN REPEATABLE

Just because you got rid of the seams doesn't mean you can repeat the texture. Large visual elements will give away your trick. Something that repeats often needs to be either very bland or mechanical.

26. WORK AT HIGH-RES

Don't build maps at the resolution you need them. Build them at 50% to 100% larger than what you think you need. You can always scale them down, but scaling up never goes as well.

27. USE FREE DISTORT TO STRAIGHTEN IMAGES

If you do get some distortion in your image, try turning on a grid in *Photoshop* and using the free distort to straighten it out. You need some extra resolution to handle the stretching but it's fairly effective.

28. REMOVE GRAZED LIGHTING THROUGH LAB

You can remove grazed lighting in texture photos by converting your image to LAB colour, blurring the lightness channel, inverting it and overlaying it back over itself. This process saves you hours of handpainting or adding gradients.

29. CUT MODELS

If you're having trouble getting something complicated mapped without stretching, cutting it is often the best solution. You can then deal with elements individually.

30. PULLING PAINT

Old pictures of concrete are great for removing 'paint' from your textures. Use them to as selection maps to subtly delete sections of your clean work and bring a new level of realism to the surface.

31. GRUNGE BRUSHES

Photoshop allows you to define your own brushes. This is a great tool for creating grunge. Find small elements in images you come across and add them to your collection. The key is to make the selected elements fairly high contrast and the selection something that doesn't look regular.

32. USE LIGHTING EFFECTS

One of the most useful texturing features is actually hidden in *Photoshop*. In the Lighting Effects filter dialog, you have a 'texture layer'. This enables you to use a channel as a bump map. You can use this feature to preview bump maps before you go through the process required to apply them to your object. It saves about three minutes for every iteration that could save you hours of work on a single project.

33. GETTING RID OF PINCHING

So what do you use Polar Co-ordinates for anyway? Well, for one, you take the pinches out of your spherical maps. Convert Rectangular to Polar and paint out the seam. Then convert from polar to rectangular, rotate 180 degrees and repeat the process. In the end, you'll have a map that looks rather funny flat but great mapped on to your object.
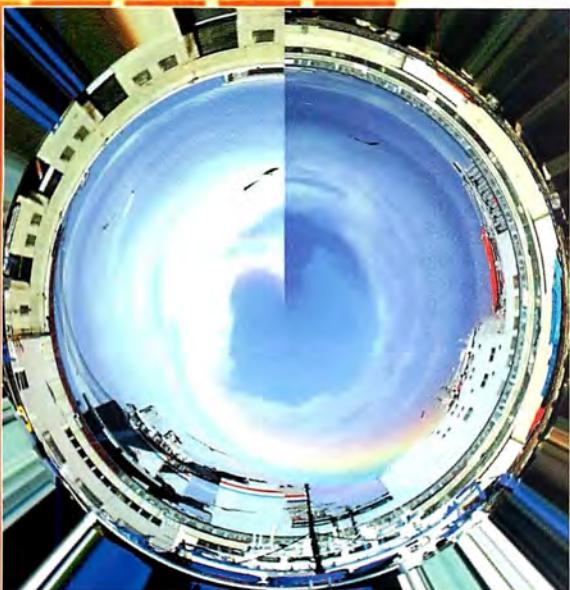
34. REMOVING SEAMS

Need to make a seamless map? The easiest way is to use *Photoshop*'s 'offset' filter that simply shifts the image by a defined amount and wraps it around to the other side. You can use this to bring your seams to the middle of the image. You can then clone out the seams and shift it back.

35. BLENDING LINE ART

Getting line art to become part of a surface can be quite a trick. Try using one of the colour channels of the underlying surface as a selection and displacing or deleting the artwork to pull it in.

36. DON'T USE CLOUDS

Photoshop has this little filter called Clouds. In your early days of 3D, you will see this as a panacea of grime. You will break up everything with it. But soon you will see the cold, lifeless nature of the effect. Then you will see it in everyone else's work – then you will quietly stop using it. I'm just saving you the time when I say stop now. It's fast and easy – and looks like it.

37. SOFTENING BUMPS

To your renderer, pure white and pure black in a bump map affects the surface exactly the same way. The greys do all the work. Even on a fairly sharp surface, you often need a slight blur to create the effect you are looking for.

ADVANCED

39. MOVING TEXTURES CAN BE FUN

Remember that textures don't need to be stationary. You can have a lot of fun with moving texture maps that represent video footage, or even creating flames with displacement maps.

40. THINK IN LAYERS

You don't have to use just one diffuse map. Try mixing a few together. By keeping them separate, you can make quick

BELOW LEFT: 32 Lighting Effects in *Photoshop* is the easiest and fastest way to check your bump maps before you bring them into your 3D application.

ABOVE LEFT: 25 It's seamless, but the dark elements in this texture are far too prominent for it to be seriously considered a repeatable texture.

LEFT: 33 By converting to Polar Coordinates, you can see the pinch you need to clone out to make you spherical maps work out correctly.

38. CAMERA MAP IT

IF YOU'RE WORKING with gross details (matte paintings, cities, etc), think about projecting an image from your camera instead of orthogonally. This is the secret to how many of the big houses do big scenes. The three images you see here seem uninteresting until you realise that they are a single photograph mapped on to two planes and three cubes. The photorealism created in minutes would be extremely difficult to reproduce with standard 3D methods. You would have to match lighting, textures and shadows – even with global illumination, this would be daunting for most. Camera Mapping enables you to step past all of this.
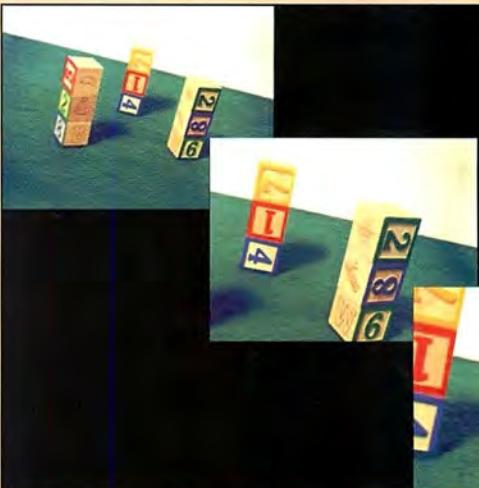
One of the grand secrets of visual effects is camera mapping, also known as image-projection mapping. It may be simple but the process has been used extensively in movies such as *The Matrix, Star Wars, Mission Impossible, Star Trek* and others.

changes to things such as water damage, brick patterns and more. These changes are made quickly and easily rather than going back into your image editor, and they allow you to sync up attributes such as specular, bump and diffuse.

41. DO NOT TRY TO SHOW ALL THAT YOU KNOW

If you notice yourself using the same cool trick you just learned, stop and consider whether it is the best solution. Every challenge is unique and so your approach should be too. It doesn't mean you shouldn't use tricks. You just don't depend on them and use them automatically.

42. ENVIRONMENT MAPS

A good environment map is often better than a Ray-trace in production. You want it to look like reality but that doesn't always mean a perfect reproduction is optimal. Sometimes cheating is a good thing.

43. MATCH SPEC AND DIFFUSE

If the diffuse is doing something, whatever is causing it would probably have some effect on the specular attributes. Make sure changes cover both areas. The integrity will make the object much more believable.

44. SPEC MAPS

MANY 3D ARTISTS seem to skip specular maps. Don't. Specular maps are usually more important than bump maps when adding detail. Nothing has a perfect specular reflection and having your highlights conform to the changes of your surface is a must. In the image here, there's no bump map (as most people would think) applied but there is a very intricate specular map applied. The break-up of the highlights push this image much closer to realism. You should never consider a surface complete until the specular highlights have been broken up to some degree.
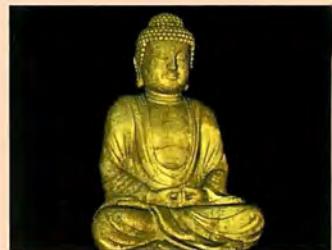
Specular maps are often missed by computer graphics artists. But often, as in this case, they are the most important attribute.

LEFT: 42 Even when dealing with reflection objects, raytracing is rarely necessary to achieve an acceptable level of realism.

RIGHT: 43 A major reason this puck works is basically due to the tight interaction between the diffuse and specular elements.

BELOW: 50 By mixing a repeating and high-frequency map with a low-resolution grunge map, we can keep our render times down while still getting an acceptable level of detail.

complicated than merely being on or off. Fingerprints and grime tend to blur the reflection in places. The best way to handle this is to create a separate map and a separate pass and bring it back together in your compositing package.

45. GLASS DIRT
If you're dirtying up glass elements, remember to match the transparency, diffuse and specular changes together. Dirt would affect all of these areas.

46. SEAMS THAT BELONG
When you have seams in the real world, you get a breeding ground for fungus, rust and other elements that leak out over a surface. Make sure to reflect this in your maps. One of the easiest ways to do this is to blur a copy of your seams and then chew them up with a grunge map.

47. SPEC SECOND MAPS
Usually, the small pieces of grit on the surface of an object create little specular hits outside of the general highlight. This is almost never seen in computer graphics and is one of the missing keys to truly realistic work. By creating a gritty specular map and widening your specular falloff, you can create a separate pass that will make your objects really pop.

48. BLURRED REFLECTIONS
Similar to the small specular hits, often a reflection is more

49. LUMINANCE MAPS
So how do you add a thousand lights to the side of a ship? Try luminance maps. Create your lighting and simply override the diffuse shading, thus creating the impression of self-illumination.

50. HIGH FREQUENCY VS LOW FREQUENCY
High-resolution details don't always require high-resolution maps. Many times, if you separate the high-frequency patterns from the low-frequency shifts, two low-resolution maps are all that's required. By repeating bland areas, you can simply break up the pattern with something softer.

character animation

PART ONE

movement matters

Over the next six issues, I will be discussing the art and science of character animation. Each article will be accompanied by a short animated sequence for purposes of illustration

BY MARK BRIERLEY

echanical functionality or poetry in motion? Two sides of the same coin, perhaps, but the character animator still has to grapple with the practical considerations of applying kinetic properties to innately inert objects while aspiring to create a convincing illusion of movement and existence.

Cod philosophy notwithstanding, success lies in the careful structuring of the peripheral attributes of any given piece of character animation. It is useful to think of an action as being part of a chain of events – individual maybe, but not independent: it does not spring into existence fully formed, and it does not leave without dropping off a calling card. For instance, some form of pre-emptive activity will not only set up the nature of the imminent movement, but also draw attention to a rapid action which would otherwise be over before the audience is even aware of it.

So, to refer to the *DaCapo* sequence on the coverdisc for a moment, take the example of Claude pressing the rhythm button on his keyboard; a small movement in itself, but because of the preparatory gesture (lift right hand, lean forward, tip head back, fix gaze on target area, cock wrist, and...), the action is unmistakable. The fact that the button isn't visible (there isn't

> ALL GOD'S CHILDREN GOT RHYTHM, AND AN ANIMATED CHARACTER IS NO EXCEPTION; IN MOST ORGANIC MOVEMENT THERE IS EBB AND FLOW

one) doesn't prevent this minimal action being clearly legible. Similarly, near the end of the sequence, Claude's actions telegraph and pinpoint his keyboard problem without recourse to zoom or close-up. This anticipation is expressed in three progressively urgent stages: realisation, speculation, and finally, extrication. Although the animation is notionally the same at each stage, there is a subtle difference in the amplitude of the activity; by just increasing the scale and extent of the animation 'travel', we have our attention focused on the nub of the problem (as, indeed, does Claude) and are well prepared for the imminent arrival of a comic event.

DIRECTION OF TRAVEL

Motion doesn't necessarily stop at the end of a movement. When Claude manages to retrieve his trapped hand, his body comes to an immediate halt while his head, arm and hand momentarily carry on in the direction of travel before snapping back into a hold. This whiplash effect exemplifies the kinetic independence and interdependence which every human body possesses. If everything came to a halt simultaneously, it would seem that a power cut had occurred, a freeze-frame rather than

01

All the images for this tutorial can be found on the cover CD

THIS SPREAD Scenes from *DaCapo* featuring the musical powerhouse that is Octavia and Claude.

a natural break in the action. This attention to over-lapping animation is an integral part of the character animator's art. Consider Octavia's dance routine (more of a jiggle, actually): if all the components of her movement – hanging arms, bobbing bunches and the like were animated on fully superimposed animation cycles, her overall appearance would be rather stiff. Delaying certain elements by sliding those cycles incrementally a few frames along the timeline will introduce a swing to the mechanics of the movement. As a general rule, the further removed an attached object is from the centre of the hierarchy, the greater the delay. With Octavia – taking her hips as the starting point – her arms are delayed by two frames, and her bunches by four, for example.

All God's children got rhythm, and an animated character should be no exception. In most organic movement patterns there is ebb and flow, periods of activity interspersed with moments of rest, therefore the animated hold should be viewed as an essential part of the animation process – a significant punctuation point in the grammar of movement, no less. Notice that when Claude is introduced by Octavia, he looks at the camera and then – nothing. No further movement is needed, no fancy animation required. We as the audience wait for a couple of beats while Claude makes up his mind about us... and then it's back to Octavia and on with the show. So, as we can see, characterful animation is as much to do with secondary movement and lack of movement as it is to do with the basic movement itself.

In the next issue of *3D World,* I'll be back to discuss the topics of pacing and timing.

3D

Mark Brierley is a freelance *Softimage* animator based in Bristol in the UK, with numerous CG-related projects under his sporran. Contact him at info@passion-pictures.co.uk

QUICK TIPS

" Look after the start of a movement and the end of a movement, and the rest of the movement will look after itself "

" Avoid unimaginative animation cycles. Every three repetitions or so, introduce a small variation to avoid the cycle becoming mechanical! "

" Search out big movements and meaningful extremes, exaggerated poses and extravagant gestures, in order to tell a clearer story "

NEXT ISSUE
the importance of pacing

SEQUENCE Claude experiences an irksome problem with the ivories.

FISH & TIPS
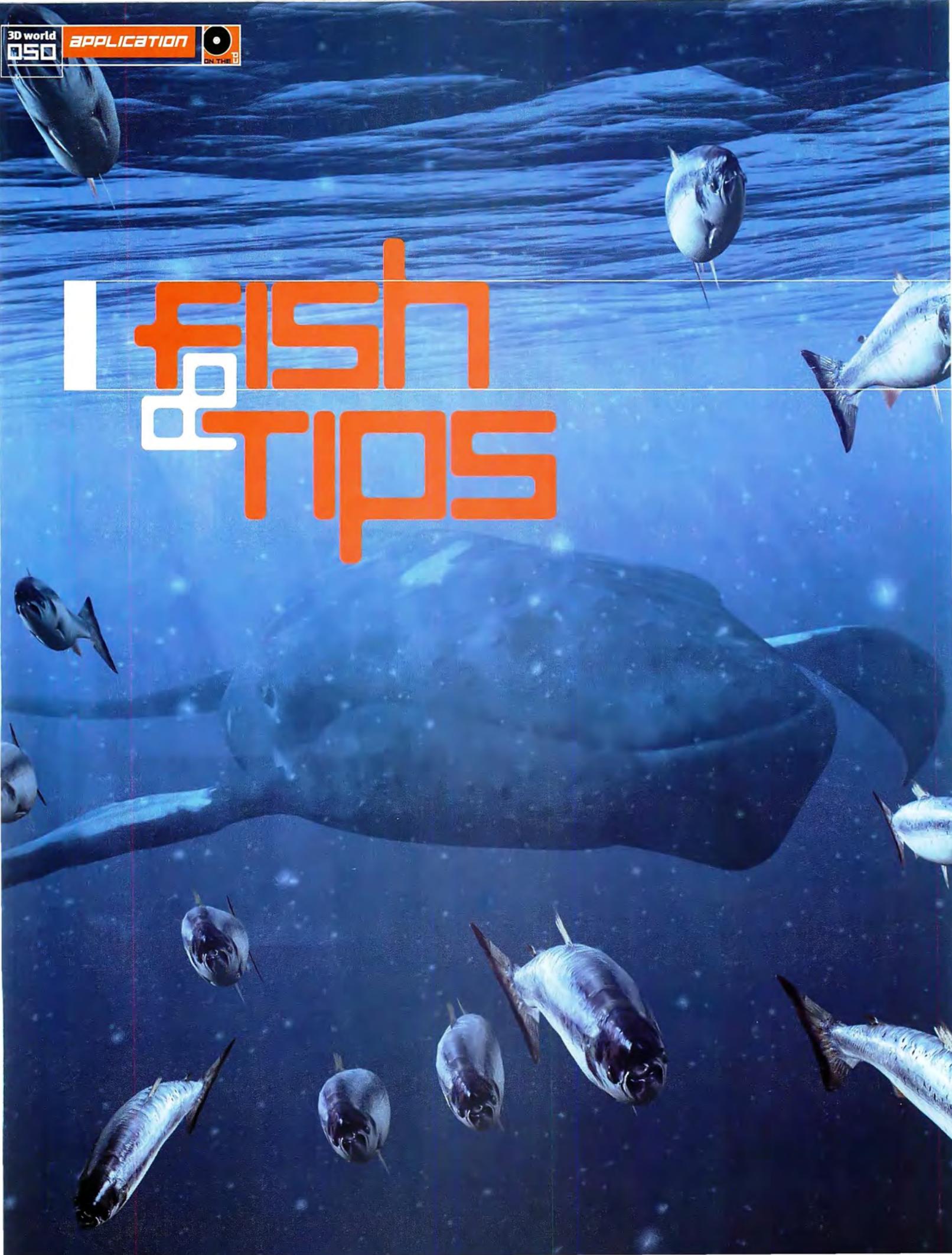
In this tutorial, we'll use *LightWave 3D* to create a simple underwater scene to give you a taster of what the software is capable of

BY BENJAMIN SMITH

F rom its first incarnation as an extra feature of the Amiga-based *Video Toaster* in the late 1980s, *LightWave 3D* has come a long way before arriving on this issue's coverdisc in demo form. Available for both PC and Mac, *LightWave 6.5* is a trusted, production-ready animation solution with credits in TV, film and game titles.

Unlike most of the other high-end 3D packages on the market, *LightWave* features two separate applications. *LightWave* modeler is a standalone program for creating and modifying objects, while *LightWave* layout enables you to animate and render. In *LightWave 6.5*, the two programs are joined by a utility called the Hub, which enables objects in layout to be available within modeler, and for modelling changes made in modeler to be instantly updated in layout.

In this tutorial, we'll be showcasing some of *LightWave's* modelling, animation and rendering features by creating an underwater scene featuring a humpback whale. We'll show you how *LightWave's* unique model format enable you to embed information such as skeletons and bone weighting within the actual model file, and then set up some simple animation in *LightWave* layout before rendering the scene with atmospheric effects such as fog, volumetric lights and particles.

The scene for the tutorial is taken from Stormfront Digital Pictures' recent simulator ride film, The Water Cycle, created for Doncaster visitor attraction, The Earth Centre. In the film, the viewer takes the point of view of a drop of water as it travels around the environment. In this sequence, we plunge into the sea to come face to face with the creatures that live there.

Benjamin Smith is 3D Director at Sheffield-based Stormfront Digital Pictures. For more information about The Water Cycle and its other projects, take a look at **www.sfdp.co.uk**

part one studying the models

Because your demo version of *LightWave* modeler can only save models with less than 200 points, you'll find all the models you need to create this scene on this month's coverdisc. However, it's worth having a quick look at the whale model before we start because a lot of the animation setup has already been done and is embedded in the model file. *LightWave* models can contain their own animation skeleton already in place and parented, as well as having weight maps that define the bones' influence. They can also include UV texture maps and morph targets, and a single object file can have several layers, with a hierarchy between them already set up. Once you've installed the package, open *LightWave* modeler and press [o] to bring up the options panel. Click the Content Directory button and set the directory to the Stormfront folder (in the Application folder) on the CD. You might prefer to copy the folder to your hard drive first so you'll be able to save your scene later on.

Load the whale model by choosing File/Load Object from the top left of the modeler interface. Go into the Objects folder if needs be and open whale.lwo. The whale object will be loaded and displayed in all four viewports. Press [a] to zoom all the viewports around the object.

The whale model uses SubPatch surfaces to create its smooth appearance. By pressing [tab] you can turn the SubPatches into polygons. Note how the model is really just a very simple, boxy approximation of a whale. Press [tab] again to switch back to SubPatches.

The top-right viewport is labelled Perspective. Under the down arrow next to the label, choose Weight Shade. In the bottom right of the screen, select the W button and from the drop-down list, choose Tail. This is a weight map – a selection of points on the model used to control the influence of Bones.

Press [space] then [w] to bring up the Polygon Statistics window. Press the white + next to Skelegons and you'll see the model's skeleton selected in yellow. From the Modify tab, you can choose Drag or press [Ctrl] + [t] and drag the joints between bones to adjust positions. Close the statistics window.

From the Detail tab, choose Skelegon Tree. Here you can see the hierarchy of the bones and the assignment of weight maps. When the model is loaded into layout, these bones will all use the weight maps we've selected to ensure they only affect the points we want them to.

part two animating the whale

In this next section, we'll load the whale into *LightWave* layout and set up the skeleton system already embedded in the object file for animation. Then we'll animate the whale to swim past the camera. As with modeler, layout has a series of tabs across the top containing all the tools and options you'll need. layout also has a series of Editors, the Scene Editor and Graph Editor among them, which can be accessed from the top of each tab. Across the bottom of the screen is the time slider and displays for the current selection mode (Objects, Bones, Lights or Cameras) as well as numerical data and playback controls. Start *LightWave* layout, open the options panel with [o] and set the content directory as we did in modeler, then activate Play at Exact Rate. This forces your scene to play in real-time so we should be able to preview all the animation in layout without having to render a test. Also set the Frames per Second to 25 and make sure that Auto Key in the middle of the bottom of the screen is off. Close the Options Panel.
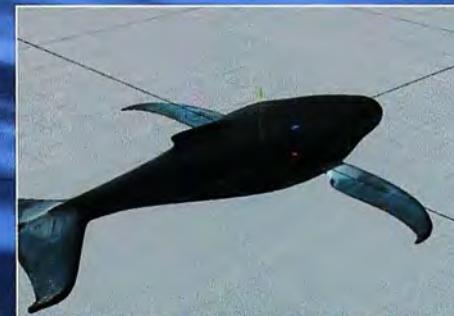
From the File pull down at the top-left, choose File/Load/Load Scene and load Base.lws. Mac users can just go to File/Load Scene. From the menu at the left of the screen, choose Add/Load Object and select Whale.lwo. The whale is loaded and appears at the centre of the grid.

Choose Add/Bones/Convert Skelegons into Bones from the Items tab. Select Bones mode at the bottom-left of the interface and cycle through them with the [down arrow] key. Select FinR (1), press [p] and turn off Bone Active for this and FinL (1) as they're not actually needed to deform the mesh.

part two continued...
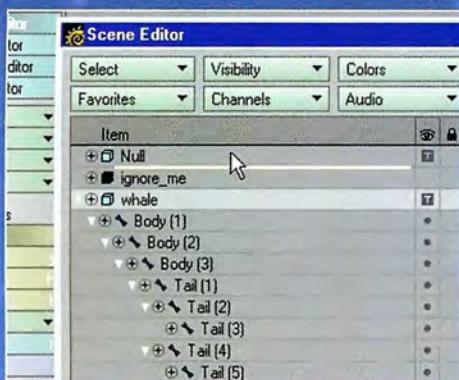
4 Close the properties panel and open the Scene Editor from the top of the Items tab. In the scene editor, click on whale to select it and drag it on to Null so an indented yellow line appears beneath. When you release, whale will be parented to Null and will have moved into a new position.

5 From the top-left of the viewport, click on the Perspective label and choose Camera View from the pull-down. Play the animation by clicking the play arrow at bottom right. Press [p] with the whale selected and set Display SubPatch Level to 1 and Subdivision Order to After Bones.

6 Select the bone Body (2) and go to frame 47 on the time slider. Press [return] twice to set a keyframe for the bone. Use the [down arrow] key to select Body (3) and Tail (1) and give them keyframes too. Repeat the process for all three bones to give them keys on frames 165 and 287 too.

7 Go back to frame 106 and select Body (2). Choose the Rotate tool from the Items tab and using the green rotation handle pitch the bone down a bit. Make a keyframe by pressing [Return] twice and repeat for Body (3) and Tail (1) to pose the tail at the bottom of its stroke.

8 Go to frame 230 and repeat the process to pose the tail at the top of its stroke, not forgetting to create keyframes with [return]. Then return to frame 0 and delete the keys for the three bones by simply pressing [del] with the bones selected.

9 With Body (2) selected, activate the Graph Editor by clicking its button on the Items tab. From the top left, select the green Whale.Body(2).Rotation.P channel and under the graph, change Pre and Post behaviour to Repeat. Do this for all three bones we animated, each time choosing the green Rotation.P channel.

10 If you play the animation, it looks OK, but it would be better if the end of the tail was a bit delayed to give it a sense of weight. Open the Scene Editor and select Body (3) from the left side of the display. On the right side, click on the purple bar which represents the bone's animation and drag it to the right, so that it begins on frame 64.

11 Do the same for Tail (1), so the first key is at 86. To enhance the animation even more, repeat steps 12 – 16 with the small bones in the tail, so that as the tail comes down the two flukes bend upwards and visa versa. Get it right and the camera skims past the tail at the end of the scene.

12 Pose the two front fins by selecting the bones in them and rotating them to rest in the water. You can add extra interest by animating them slightly over the course of the shot so it looks like the whale is steering itself along.

part three rendering the environment

1 If animation is not your strong point, you can load the scene so far by loading Whale_anim.lws. In this section, we're going to set up the rest of the scene to create the underwater environment around the whale. First, we'll colour the background around him and add fog to simulate the colour and density of murky water. We'll add an object for the sea surface above us and load in some lights. We'll also add another light to simulate rippled light on the whale with an image sequence and add some particles to the water to look like bits of suspended matter and render them with HyperVoxels. We'll then add some bubbles streaming from the whale's blow hole, and finally we'll set up a volumetric light to create shafts of light filtering down through the water. To start, drag the time slider to frame 50 and do a render [F9] to see what the scene looks like at the moment. You can minimise the render window and use its Layer pop-up to refer back to previous versions as you work on the scene.

2 From the Scene tab, select Backdrop and in the Effects panel, activate the gradient backdrop feature. This has already been set up to graduate the backdrop between light and dark shades of blue. You can see the effect when you render the frame [F9].

3 Switch over the Volumetrics tab, set the Fog Type to Nonlinear 1 and make the Max Distance 35m. Set the minimum amount to 40 per cent and activate Use Backdrop Colour. Close the Effects panel, press [d] and in the Display Options, make sure OpenGL Fog is switched on.

4 We'll merge some lights from another scene. Press [Ctrl] + [Shift] and click on the viewport. From the pop-up menu that appears, select Load Items from Scene and load Lights.lws. Opt to load the lights as well as objects.

5 Press [L] and select Old_Light from the Current Item pop-up at the bottom left of screen. Press [–] to delete it from the scene. Simply render [F9] to see the new lighting setup in action.

6 Load the object Sea_surface.lwo. Press [p] to bring up its properties and under the Deformations tab, press the T button next to Displacement Map. In the next window, change the Layer Type to Procedural Texture and hit Use Texture.

7 Back in the Scene Editor, select Caustic_Light. Press [p] and set its Intensity to 150 per cent. Load caustic_(sequence) as a Projection Image. Set the colour to 255 250 229 so the light filtering through the waves looks a little warm. Render a frame [F9] to check out the lighting effects.

8 Add some bits floating in the sea by loading Particles.lwo. In the scene panel, click the Textured Shaded Solid icon in the eye column and set it to Vertices. Although you can see these points in the viewports, they won't render unless we add the HyperVoxels filter to them.

9 On the Scene tab, select Volumetrics and on the panel, double-click on HyperVoxels 3.0. In the HyperVoxels panel, select the object ignore_me and hit Copy, then select particles and press Activate. The object's name will turn black. Select it and hit Paste. Hit VIPER for a preview of the particles.
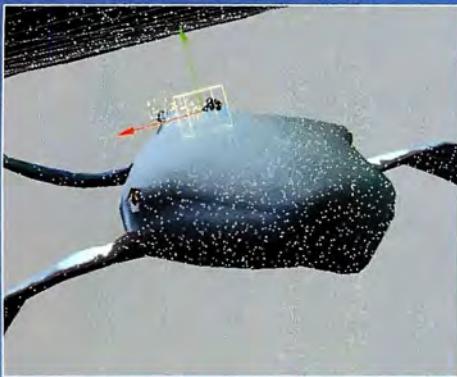
30 Now we'll add a few bubbles. From the Items tab, Add/FX/Add_Emitter and name it Bubbles. Using the Scene Editor, drag Bubbles on to Whale, and then in the viewport drag it up, so its centre is in roughly the right place for a blow hole. Keyframe it by pressing [return] and make sure you Set Key At frame 0.

31 On the Scene tab, select FX_Property to bring up the properties for the emitter. Set BirthRate to 60, Generator Size to 100mm in the x, y and z-axis, and on the Particle tab, set the Lifetime to 100. Put 0.1 in the +- field for Particle Weight to vary the value for each particle. In the Motion tab, set Explosion to 0.4 and Vibration to 0.2. On the Other tab, make Gravity 2 in the y-axis.

32 Repeat step 26, this time copying the HyperVoxels settings from ignore_me_too on to Bubbles. Once you've done this, deactivate ignore_me and ignore_me_too and delete them from the scene. Render a test or use VIPER to see the Bubbles.
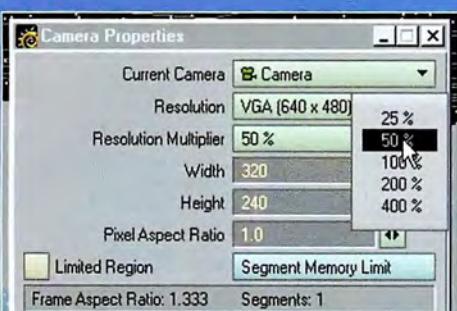
33 To finish the scene off, we'll add a Volumetric Light to simulate shafts of light filtering through the water. This effect looks beautiful, but it's really going to add to the render time. You might like to enter the camera properties panel and the set the Resolution Multiplier to 50 per cent.

34 In the Scene Editor, select the light Volume_Shafts and click under the column marked with an eye to make it visible. Press [p] and activate Volumetric Lighting. Note that Affect Diffuse and Specular are deactivated, so the light doesn't actually illuminate the scene apart from the Volumetric effect.

35 Enter the Volumetric Light Options and set the Height to 14m, Luminosity to 50 per cent and make the medium colour 011 015 019. Press the VIPER button to activate a preview, which will update as you change the settings. If the update is a little slow, set it to Draft Mode or use a smaller Preview Size.

36 Click Edit Texture and set Layer Type to Procedural Texture. Set the colour 164 202 255 and contrast to 100 per cent. Make the size 0.1m in the x and y-axis and 10m in the z-axis. VIPER should show you a good view of shafts of light filtering down into the water. You might have to use the Best Quality setting.

37 Do a Load from Scene and load Salmon.lws. This scene contains a model of a salmon animated to swim along. Animate a couple of these to swim past the camera at the start of the shot to add extra interest. You can offset their swimming action by sliding their bones keys in the Scene Editor.

38 Render the scene. From the Items tab, select Rendering/Render Options and activate either Save Animation, to generate an AVI or QuickTime file, or Save RGB to make an image sequence. Unfortunately, you'll have to buy a full licence to get rid of that annoying watermark.

GUINNESS SURFERS AND DREAM CLUB © An Academy Production For Abbott Mead Vickers BBDO; THE BEACH © A Figment Films Production for 20th Century Fox

CFC
factory of digital fantasy

One of the pioneers of digital film is still working on the cutting edge, pushing the boundaries of what's possible with CG fur for rodent boozers

BY ANDY STOUT

ALL PICTURES COURTESY OF: Computer Film Company

About four years ago now, the Computer Film Company decided that enough was enough and moved out of its Berwick Street rabbit warren – all muddled, dark, twisty passages where the doors never shut properly due to the multi-coloured bundles of cable in the way – into the airy splendour of its current 1929, art deco Wells Street headquarters. It gutted the interior completely in the process and set about creating an ergonomic working environment designed around the modern, digital post-production process. In the basement, there's a screening cinema inherited from former occupant Columbia Tristar, while the other floors are all light and air, with workstations set in 'pods' around which artists can move screens to cocoon themselves in darkness when needed.

It's a grand building and by all accounts an impressive place to work, and its sheer physical presence only serves to confirm CFC's status in the top flight of global post facilities. Much of what has happened in digital film effects over the past 15 years started at CFC. The company bootstrapped itself into digital film at the end of the 1980s by building its own workstations and film scanners; working on each frame on the fly as it was scanned in before recording it back to film. Since then, it's worked on well

ABOVE LEFT *Guinness Surfer,* probably as good an advert for CFC's commercially available keying package, *Keylight,* as it is for the black stuff.

BELOW LEFT Stills from *Guinness Dream Club* of a pint-quaffing squirrel.

ABOVE Realistic swirling phosphorescent plankton recreated for *The Beach.* Simple figures of the actors were roto-tracked and then used to generate turbulence using *Houdini's* particle operators.

over 100 films (the Internet Movie database currently lists 139) including *MI:2, The Beach, Sleepy Hollow* and *Chicken Run;* made what's widely regarded as one of, if not the best commercial ever with Jonathan Glazer's *Guinness Surfer,* and debuted a stack of now commonplace techniques. Many of these occurred on lesser-known films, such as its breakthrough motion-tracking work on the titles for 1991's *Blonde Fist,* but they're certainly no less impressive for all of that.

The GIP workstations (it stands for Graphical Imaging Processor) are still in use 14 years on. "They're not quite the originals and while they're sort of being phased out, they're such productive machines they still rip through certain jobs better than some of the off-the-shelf software," says Dominic Parker, head of film animation. "They're better than Cineon on some jobs, better than Shake for others, and great while we're waiting along with the rest of the industry to find out what's going to be the next major 2D platform."

INVISIBLE WORK

Parker has been with the company for a fair few years now, and points out that seven years ago, the 3D department was effectively just him. "It grew very slowly," he says, "Fluctuating

MAIN The nut-fancying star from the latest Guinness commercial, *Dream Club*.

BELOW Many elements in *Chicken Run*, such as water, fire, steam, smoke and gravy, were generated in 3D using a combination of *Houdini* and *RenderMan*, care being taken to make them 'Aardman-realistic' rather than photo-realistic.
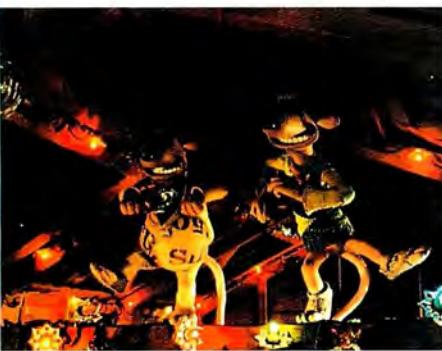
TOP RIGHT A close-up on the Horseman from *Sleepy Hollow*. An underlying skeletal structure was designed using *Maya* and *Houdini* to dynamically drive the collar model.

BOTTOM RIGHT A scene from *The Beach* created using a digital rock quilt of five different samples.

between four and six people, and we developed a reputation as being a 2D house in that time. Even though we did a lot of very strong 3D projects, it tended to be invisible work and not obvious. We've been fighting against that reputation all the time, and in the last six months we've decided to expand to around a dozen people with a view to really promoting this side of CFC's work."

Part of that expansion has seen the company take on Sally Goldberg as head of creature animation, CFC reasoning quite correctly that character animation is seen as the most challenging area of 3D and therefore to get involved in the most exciting projects, it needs to be prominent in that kind of work. It's a move that's already bought dividends as well, the 3D squirrels in the company's latest Guinness outing, *Dream Club*, drawing a fair amount of attention and taking CG fur to a new level of excellence (see boxout).

Equipment in the 3D department is a mix of SGI and NT machines, backed up by a Linux renderfarm and running the ubiquitous *Maya* alongside Side Effects' *Houdini* (Linux tests are underway with both of those packages as well). "We're slightly biased in

favour of *Maya*, but it's almost 50/50 with *Houdini*," explains Parker. "Things are then put through *RenderMan* for the most part, with only occasional use of package renderers. There's a steep initial learning curve with *Houdini* and I think that might frighten some people off, but it also appeals to people who are strong technically as well as creatively; people who aren't afraid of applying

> ## "WE'RE SLIGHTLY BIASED IN FAVOUR OF MAYA, BUT IT'S ALMOST 50/50 WITH HOUDINI"
> **DOMINIC PARKER**

some basic mathematics to their work, who want to understand the way things work technically and take things apart and put them back together again," says Parker.

SOCKING LUMPS

In practice, CFC often ends up using the two packages in tandem, as with recent work on the climactic scene in *The Mummy Returns*, which

required the characters to be bombarded with stalactites. Safety concerns discouraged the production from dropping socking great lumps of rock from 40 feet up on to their leading players, so the CG route was decided on fairly early. Each stalactite model was broken into several large chunks of rock and then animated using rigid-body dynamics in *Maya*, giving their motion and collisions a degree of realism that would have been extremely hard to keyframe.

Once this basic movement of the large chunks of a stalactite falling, breaking up and coming to rest was done, the animation was then moved from *Maya* into *Houdini*, where smaller-scale rocks and dust was added to the large chunks. The smaller-scale rocks were done by breaking up the basic stalactite shape using turbulence functions and then mapping particles to them whose speed was derived from the rock size. The particle movement was then mapped back on to the broken pieces of rock. The dust, meanwhile, was courtesy of another particle system whose birth rate and animation was driven by the large and small rocks and timed to the moment of impact. A practical bluescreen shoot

> THE COMPANY IS BUSY WITH RESIDENT EVIL, BLADE 2 AND A FEW OTHER PROJECTS THAT NO-ONE WANTS TO TALK ABOUT JUST YET

was also undertaken featuring plaster stalactites filled with rubble and Fuller's Earth. These were used first as a reference, then comped into the final shot for what Parker refers to as 'richer results'.

BUZZING PODS

Currently, the pods at CFC are buzzing. Having just finished up its own share of work on *Tomb Raider*, the company is busy with *Resident Evil*, *Blade 2* and a few other projects that no-one wants to talk about just yet. The R&D effort continues too, with the wraps having just come off CFC's newest film scanner, *Northlight*. The scanner is a direct result of the increasing trend towards creating digital masters of entire films rather than simply scanning in the effects sequences and, according to head of

SQUIRRELLING AWAY

SHOT OVER SEVEN DAYS in Budapest last December, *Dream Club* is the fourth outing in Guinness' 'Good things come to those who wait' campaign. CFC's work on the slot included extensive rig removal, crowd replication and general compositing duties, but by far the most intense work was reserved for the 3D squirrels. While only taking up approximately six seconds of airtime, three months was spent labouring over their creation.
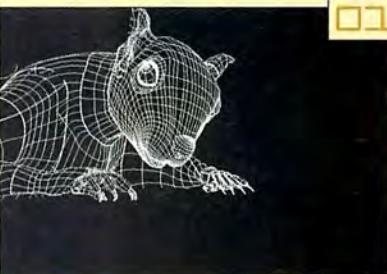
01 The squirrel models were created in *Maya* with an accurate skeletal structure and some additional facial musculature being needed to ensure they could speak properly. Live animals were borrowed from an animal rescue centre and filmed and photographed in the CFC boardroom to ensure accuracy.

02 The wireframe model comped into the background plate, with image-based lighting used to ensure that it gels realistically with the real-world shot.

03 *Maya's* fur routines were tested but were ultimately found lacking. To handle the image-based lighting information and produce the fur, CFC's Oliver James developed his own routines using the *Maya* plug-in, *M Tool*, as a basis.

04 Not just these whiskers and tail hairs were created individually, but the whole of the squirrel's coat. Adapting *M Tool* to their own needs enabled CFC to perform numerous tweaks, such as changing the hairs from the software's default conical shape to a trumpet one.

05 The end result after digital grading. Initial squirrel models had to be changed as the client wanted ones that looked less healthily perfect and more like proper, hardened drinkers.

LEFT An *MI:2* shot relying for its success on the bread-and-butter process of rig removal, which is often performed at CFC using Pinnacle's *Commotion*.

RIGHT A scene shot at the botanical house at Kew Gardens for *The End of the Affair*. Because of the delicate nature of the plants, smoke couldn't really be used on set, so the entire smoking ruin in the background was created in *Maya*.

BOTTOM RIGHT Two images of the Headless Horseman from *Sleepy Hollow*. The rider's head was encased in a blue cloth bag and removed in 2D. CFC created a 3D collar for the shoulder and neck area and mapped it on to the body.

R&D, Steve Chapman, will scan in at 2.7 seconds per 2K frame. That means a single machine alone can digitise 50 complete feature films a year.

Chapman acknowledges that there usually comes a point when you have to stop development, admit the rest of the world has caught up with you and buy off-the-shelf kit (workstations and film recorders being good examples). There are still plenty of challenges for CFC's R&D division to cope with though, one of which is the practical implementation of image-based lighting.

"This is why these chrome balls have been cropping up on film sets everywhere," says Parker. "Previously they were used to give you a record of the lighting set-up, but now they're being used to sample it. We take a series of different exposures of the chrome ball using a high-resolution digital camera which are calibrated so that we know the relationship between the different exposures. These are then put together to produce one image with a high dynamic range, which is unwrapped to produce an environment map. That map is then processed in various ways so that it can be used to light any CG element put into a scene. It works well on all types of surface, but for the shiny metal on a car, for instance, it works really nicely because you see the movement of the various different degrees of specularity across the surface. It means that for lighting – which historically has been the weakest aspect of CG – we now have a way of making our lighting models much richer."

Tests are also underway on Aardman's latest, *Hare & Tortoise*, which is going to follow the all-digital route pioneered by *Chicken Run* at CFC and over in the States by the Coen Brother's *O Brother, Where Art Thou?* Putting a 'look' on films in the way the Coen's did is one of the hotter topics in post-production this year, directors increasingly wanting to sit in a comfortable suite when all else is completed and finesse things to their heart's content. The kit that's going to be used for this creative colour grading and the environment that needs to be provided for it are still uncertain across the industry. CFC though, as usual, seems to have a head start.

QandA

How can I model objects from photographs using *LightWave*?

JAMES BINNS, VIA E-MAIL

Lately, some impressive software packages have emerged that enable you to model objects directly from photographs. While it looks complicated, the basic idea is straightforward and you can achieve much the same effect manually in *LightWave* by matching a model to a photograph and using the *Baker* plug-in to bake the image into its textures. You'll obviously need an image to work from, and it helps if it's of much higher resolution than the destination media, so a scanned photo works best.

Start by loading the image into layout's background and then go into modeler and build a very rough version of the scenery.

LEFT The original photograph with a wireframe of the 3D model lined up to match. The buildings had to be modelled leaning back at an angle to get this to work.

BELOW A layout view of the model with the photograph baked into its textures. Although some bits don't work very well, careful adjustment of the texture in *Photoshop* fixes the problems.

Load it up in layout and use it as a guide to line up the camera to match the scene. This is the tricky part, as you've got to make sure the perspective of the virtual scene matches as closely as possible the perspective in the photograph. Remember to consider factors such as the height of the camera off the ground, the position of the horizon and the zoom of the lens. You don't have to match it perfectly, however, because you can always distort the model a bit to make it fit. Having got a good camera match, go back into modeler and rebuild the model so that it matches the background photo as closely as possible. Don't go mad adding all the little details you can see in the photo – just get the main shapes. By flipping back and forth between modeler and layout you can adjust the model and check the alignment as you work.

With the rough model finished, merge all its layers into one, triple any polys with more than four points and give it the surface name Sticky. Create an Atlas UV map for the entire object and name it Atlas. In layout give the Sticky surface a colour texture map with front projection co-ordinates, using the same image as the background. Activate Fixed Projection and de-activate Pixel Blending and Texture Antialiasing. Add the *Baker* plug-in to the surface and set the UV map to Atlas with a high image resolution – 2,000 pixels is good – and set a save image type and filename. Set layout's default Light to 0% intensity and crank the ambient setting up to 100%. Press [F9] to render a frame and when the *Baker* interface is done, quit the render.

Save the model with a new filename and remove the texture map and the *Baker* plug-in from its surface. Add a new colour map using the Atlas UV co-ordinates and load the image that *Baker* just created. You might have to use the Image Editor to disable the image's Alpha Channel. If you've got real-time textures enabled in layout, you'll be able to see the model textured in the viewports and you can move the camera in and out.

The biggest problem with this technique is that bits of the texture will be missing – usually bits that are hidden behind other objects – but with a little careful cloning in *Photoshop* you can usually overcome this. **BY BENJAMIN SMITH**

Q: Using *Maya*, how do I create the effect of ripping a hole through a metal wall? JOHN THORBURN, VIA E-MAIL

A: There are lots of steps to follow here so let's get to it. In modelling mode, create a NURBS plane. To give you more geometry to work with, use the attribute editor to give the plane's U and V patches a value of 10. Then select the CV Curve tool. Use the Curve tool to draw a jagged hole shape over the NURBS plane. Duplicate the curve. Move both curves in the y-axis so that they rest either side of the NURBS plane. [Shift]-select both curves then go to the Surfaces menu and choose the Loft tool. You'll now have a curvy lofted shape that bisects your plane. Press [3] to see the lofted shape look smoother.

We're going to use the lofted shape as a sort of cookie cutter. Create a curve on the plane's surface by [Shift]-clicking on the plane then on the lofted surface. From the Edit Surfaces menu, choose Intersect Surfaces. This will create a curve where the lofted shape and plane meet. From the Edit Surfaces menu, choose the Trim Tool. Click on the plane. It will turn white. Now click on the area you want to keep which, in this case, is everything outside of the lofted shape.

A yellow square will appear on the area you're going to keep (see the left plane in the first image). Hit [Return] and the area inside the lofted shape will disappear. Now tidy things up by deleting the lofted surface and the curves that created it. You now have a hole in the NURBS plane.

The plane is still very two-dimensional so let's make the rips fold forward as if the hole has been torn in the metal sheet by a strong force. Select the plane and right-click on it to invoke the floating menu. Choose Control Vertex. You can now use the manipulator tool to pull the edges of the hole forward to create folds in the plane. See the middle plane in the image below.

The edge of the hole in the NURBS plane still looks fairly two-dimensional. We're going to bevel it a tad to give it a more realistic rounded edge. Select the plane and right-click on it. Choose Trim Edge. The edge of the rip will highlight in yellow. Go to the Surfaces menu and select the bevel option box. Experiment with different bevel widths, depths and extrude height options to get an effective edge to your hole. I chose to give the bevel an extrude height of 0.0976. The bevel cap edge was convex. I bevelled the top side where the bevelled shape met the hole edge. See the right plane in the image below left.

To polish things off, I created a Blinn Material shading group for the metal wall's texture so that the highlights of the bent and twisted geometry would reflect the lights with a metallic sheen. As it's a NURBS surface, the texture map accurately follows the plane's UV co-ordinates and bends accurately with the metal geometry without stretching. **BY GEORGE CAIRNS**

LEFT The evolution of our NURBS plane from flat and solid to jaggy and torn thanks to the Curve and Trim tools.

BELOW The texture map follows the bends and twists of the plane's UV co-ordinates. The dinosaur was one I prepared earlier.
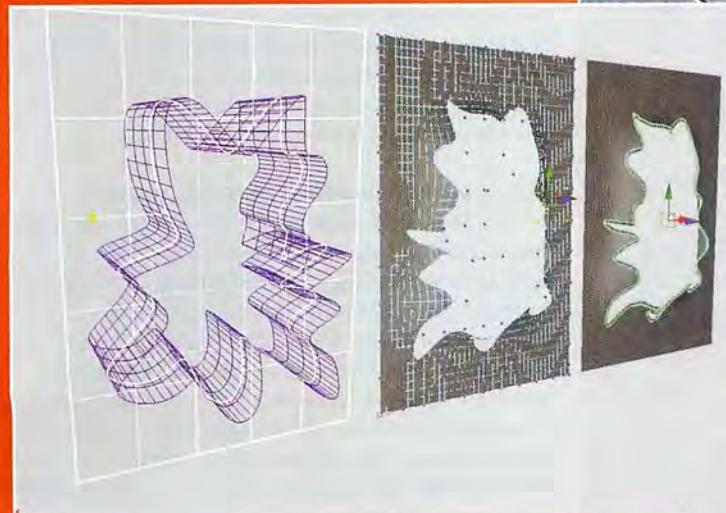
Q: Everything I do seems to look like plastic! How can I create a metal look in *ElectricImage*?

CORKY BURGER, CALIFORNIA

A: While elusive in many applications, the process of creating realistic metallic surfaces is actually fairly straightforward. Essentially, five steps will take you 90% of the way there.

01 CREATE STEEP DIFFUSE AND SPECULAR FALLOFFS

When a surface is porous (as with most plastic surfaces), it has many small facets pointing in directions that aren't parallel to the overall surface. These small facets reflect light far past the centre of the main highlight. This causes a slow shift from light to dark. Metal, at a microscopic level, it not very porous and, as a result, tends to shift from light to dark quickly. *ElectricImage* (and most applications) set the falloff to something that resembles plastic instead of metal. By turning the diffuse and specular falloff up to 2-4 instead of 1, you will get something that looks much harder.

02 LOWER YOUR DIFFUSE VALUES

In life, there is no 'diffuse reflection' or 'specular reflection'. There are just surfaces and the propagation of light. If the diffuse has a high value, the specular tends to be lower. And in this case, if the specular reflections are high, then the overall diffuse values should be lower. You can think of it as the conservation of energy. A surface has to find a way to emit all the light through diffuse or specular reflections but the result is always 1.0 (unless it absorbs a percentage).

03 MATCH YOUR SPECULAR REFLECTION COLOURS TO YOUR DIFFUSE COLOURATION

Many 3D artists tend to overlook this nugget. The specular

BELOW Even when we add a reflection, we have trouble. Without lowering the diffuse values, the surface blows out.

BELOW (INSET) Here's where our sphere started. As you can see, the diffuse and specular falloffs create the feeling of plastic.

RIGHT Our final sphere. Notice the near absence of diffuse values outside of the imperfections.
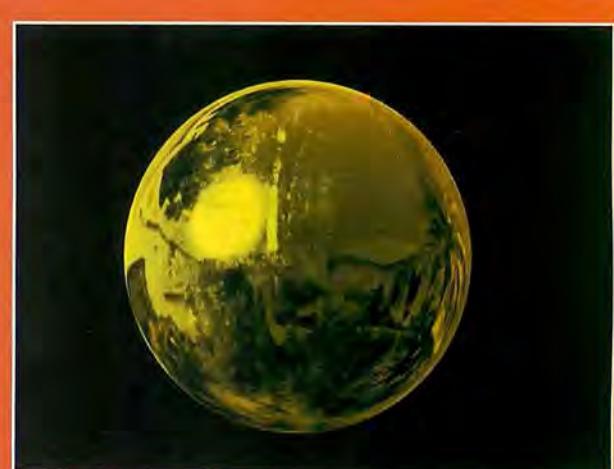
reflections of an object will always be tinted towards the diffuse colouration. This is not the case with plastic, so if you don't tint your specular highlights and reflections, it will always resemble a bleach bottle. *ElectricImage* makes this easy. You can simply turn the Diffuse Bias check box on in the specular and reflection dialogs to achieve this effect.

04 INCORPORATE FRESNEL REFLECTION FALLOFF

When you throw a ball at an angle, it tends to bounce away at the same angle at which it hit the ground. However, it you drop it straight down, the result is very unpredictable. The vector is neutral and subtle variations have more influence on the direction of the path. Reflected light works in a similar way. When we see a reflection on the edge of a surface, it tends to be clearer and more mirror-like. As we look at the same surface straight on, much of this mirror-like appearance goes away. This is often referred to as the Fresnel Effect. In *ElectricImage*, you can add this effect through the Reflection Falloff filters.

05 MATCH YOUR DIFFUSE AND SPECULAR MAPS

Many artists work on their texture maps without taking into account the close relationship between the diffuse and specular reflections. The maps used to break up the diffuse attributes should be closely related to the specular reflections. Also, you often have to invert diffuse values, creating light areas where there are no reflections. Remember, if the specular reflection is lessened, we need to increase the diffuse values. So, if you follow these steps, you still won't have a perfect metallic surface but you'll soon be in a place where you can be tweaking rather than floundering in settings.

BY ALEX LINDSAY

Q. I've read somewhere that *Rhinoceros* is very efficient at creating 3D models of boat hulls. Being a designer of surfboards, I was wondering if it could help visualise and ultimately improve my designs   **JOHN SIMMONDS, WILTSHIRE**

a. All the available 3D modelling packages have their own merits when it comes to creating various types of models. By the very nature of NURBS technology, *Rhinoceros* is a very useful tool when you want to create models which involve sweeping, or lofting numerous sections. For this reason, I do not see why you could not utilise *Rhino* to help design your surfboards. I will detail a couple of techniques which you could use to model the shapes that you may require.

Lofting cross-sections is the most obvious choice to create the required sections, but first you have to accurately create the sections. One useful way of doing this is using Csec Profiles. Using the standard curve tools, create four profiles of the top, bottom and sides of the surfboard as shown in the bottom image. These only need be rough at first. You can now turn on the control and edit points in which to tweak the curves. At this stage, you could generate numerous different styles to whatever specifications you require. The Elmo command is also very useful as you can rebuild the curves to hold more or less points in order to make more specific tweaks.

Step 2 in the image below right shows the curves rebuilt with 20 edit points. Next use the Csec command, also found in the Curves menu as Csec Profiles. It requires the four profile curves to be selected in order. Then, in one of the orthographic views, draw lines perpendicular to the profiles, which then automatically creates the cross-sections. Step 3 shows how the final curves should look. When using the Loft command on the curve sections, use the Point option on the start and endpoints of the surfboard to ensure the complete surface is closed. The final rendered model should look like step 4.

Another tool that is useful for controlling the shape of your board is sweep. *Rhino* has two kinds of sweep, using either one or two rails. The two-rail sweep is probably the more useful where only two profiles and a number of section curves are needed. This can found in the Surfaces menu, or by using the Sweep2 command. Rather than with Csec, where the sections were created from the combination of the four profiles, Sweep2 enables the user to directly create and control the actual sections.

As before, these sections can be tweaked to create a multitude of designs. In order to show how this works, I have used the sweep to model the fins. Two profile curves were created for the general fin shape, then the start cross-section was created. If a change in cross-section was needed through the fin then more could have been added, but for this example only one section was chosen. The final model shows that with three simple shapes, a complex object can be built in no time at all.

I am also assuming that you will need to create physical prototype models. *Rhino* also exports to STL format, which can be used to have rapid prototypes produced. So, to conclude,
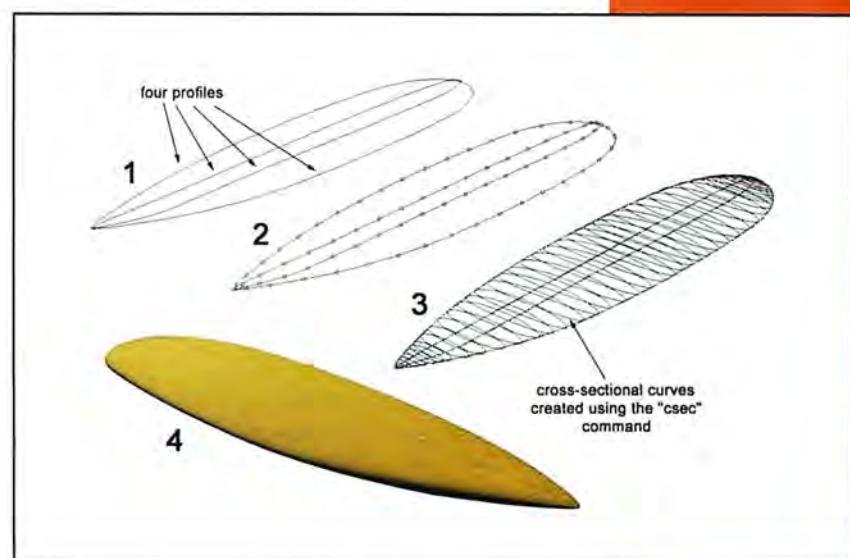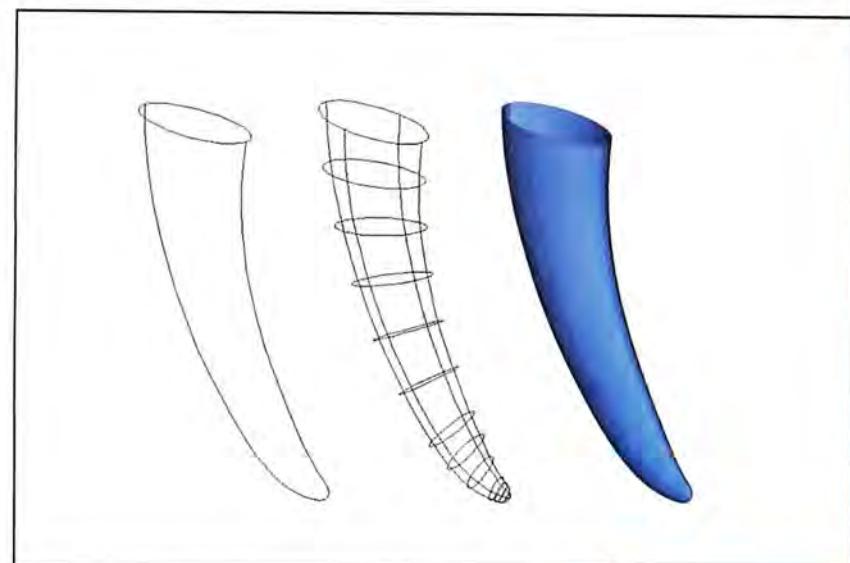
you can design the boards interactively onscreen to achieve the optimum shape, and then use the data to create renderings and perhaps get the designs prototyped. Remember, however, the software cannot improve your designs, only improve on the process in which you design!   **BY NEIL RENNISON**

four profiles

1
2
3
4

cross-sectional curves created using the "csec" command

TOP A fin created from only two profiles, a section curve and a two-rail Sweep.

BOTTOM Four steps to creating a surfboard using Csec Profiles, and Loft.

If you have a question for our 3D experts, simply send it to us at 3dw.qanda@futurenet.co.uk. You find more Q&A advice on our Web site at www.3dworldmag.com

second perspective

saluting the unsung heroes

The position of character animator may carry more kudos than that of technical director, but neither role should be undervalued   BY SHELLEY PAGE

The graduation season approaches and as I can at last venture outdoors without my overcoat, I begin to anticipate a new influx of showreels through my letterbox. Based on past experience, it's a fairly safe bet that the majority will be accompanied by a letter describing the author as a character animator hoping for a job on one of our productions. While no-one would want to deter a talented individual from embarking on such an interesting and hopefully lucrative career, I do sometimes wonder why so few folks ever describe themselves as a would-be technical director or technical animator. Maybe character animators attract more attention – but without technical directors, they could not produce anything like the fantastic images we are seeing as technology advances, seemingly daily.

At PDI/DreamWorks, everyone involved with the images that end up on screen is described as an animator – but we separate them into groups devoted to motion (which includes character animation) and everything else (which includes layout, effects and anything that doesn't move). Where the US scene differs from that in the UK is that over here animators are more likely to be generalists – good animators who also have great technical skills. At Mill Film and Framestore, skilled TDs are in great demand on ambitious projects such as *Gladiator, Beasts* and *Dinotopia*. The award-winning crowd replication in *Gladiator* created by Dave Lomax and his team at Millfilm was justly celebrated, and greatly increased the international profile of homegrown special effects. At Framestore, Mike Milne looks for talented graduates from schools such as Bournemouth and trains them on the job; there are currently five TDs working on *Beasts* and another 12-15 on Dinotopia.

> AT MILL FILM AND FRAMESTORE, SKILLED TDs ARE IN GREAT DEMAND ON AMBITIOUS PROJECTS

A great example of the key creative role TDs play is my current favourite ad – the Aero hula-dancing mouse created by Passion Pictures and Glassworks. While Passion is well known for great 3D animation, its undoubted strength is in traditional character animation, so when Passion was commissioned by Lowe Lintas to produce a realistic-looking mouse, executive producer Andrew Ruhemann approached Alastair Hearsum at Glassworks to collaborate on the project.

"We saw an opportunity to pair our traditional character-animation skills with the 3D modelling and computer-animation expertise at Glassworks," says Ruhemann. The final result, directed by Alyson Hamilton and animated by Russell Brooke, Chris Hauge and Tim Watts, is completely convincing. So the odds of ending up in an interesting job seem a lot higher to me if the candidate expresses interest in lighting, modelling, texture creation and special effects as well as pure animation, especially as a really top-flight TD can command anything up to £150,000 a year. Not many animators are looking at a paycheck like that!

SHELLEY PAGE is the European Representative for Animation at DreamWorks. www.dreamworks.com

FOR ALL WEB DESIGNERS

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THIS MONTH: THE FLASH ISSUE

Over 95 per cent of the world's Internet population is kitted out with *Flash*, and Web designers are using it more innovatively than ever before. That's why *Cre@teOnline* is devoting a special issue, direct from San Francisco, on the product that's changing the face of the Net. In our July issue we uncover what you need to know about the future of Web design and *Flash's* role in it. We've got the inside scoop from Macromedia, revealing how the company sees it developing, and we expose the hopes of professional designers from the US and Europe.

PLUS:

Over 50 tips from the world's best *Flash* artists

Flash founder Jon Gay explains how it got so big

The ten best *Flash* artists from around the globe reveal the secrets of their success

20 inspirational *Flash* sites (and not a Skip Intro among them)

What today's professional designers want from the next *Flash* incarnation

How *Flash* fits into the Web agency of the future

ON SALE: THURSDAY 14 JUNE

Cinema 4D XL 7

The powerhouse animation package continues its ambitions for the high-end

BY SIMON DANAHER

MINIMUM SYSTEM
- Windows 95/98/NT/2000 or Macintosh OS 7.61+
- Any Pentium or PowerPC
- 64MB RAM
- CD-ROM drive/hard disk drive
- Net connection for updates

MAIN FEATURES
- Radiosity
- Caustics
- Improved anti-aliasing
- Enhanced material system
- Bundled *Smells Like Almonds* version 2.5
- Blurry reflections and transparency
- Image-based lighting
- Multipass rendering
- Unclamped material channels
- Separate light passes
- Three-client network-rendering licence
- ExplosionFX
- Polyreduction
- New Post effects
- New Render tag
- New Stop Hierarchy tag
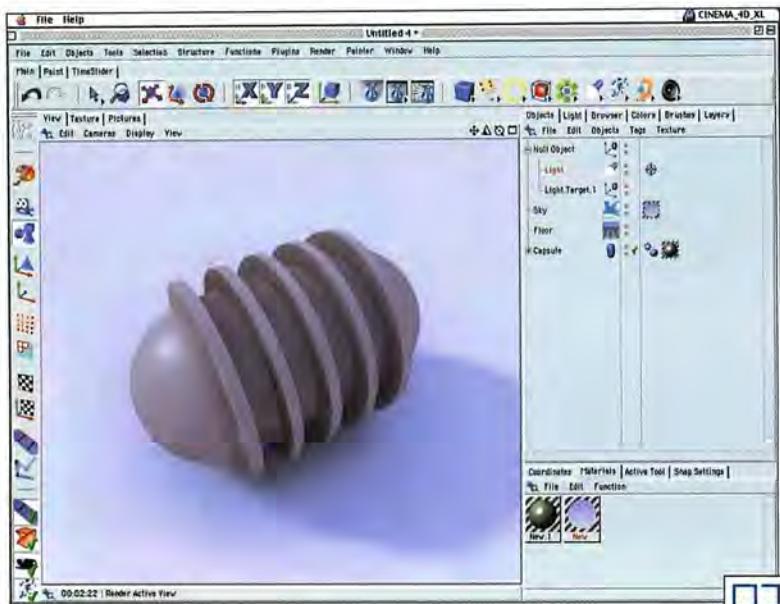
axon Computer's 3D animation package, *Cinema 4D* has progressed from being a mid-range package to high-end contender at a pretty even pace. Features such as rock-solid stability, a great interface and fast raytracing have earned it respect throughout the industry. However, Maxon appears to have been burning the midnight oil and has released a new, whole integer version of its animation package, *XL 7*, only eight months after the release of version 6.

There are few companies that keep such an impressive upgrade schedule, Alias|Wavefront being one, and it's a very important consideration when choosing a 3D package as it could mean the difference between getting a major upgrade every eight months as opposed to every two years. There's nothing more frustrating than seeing your favourite 3D package stagnate while others around you are being regularly updated.

One of the biggest complaints about *Cinema 4D XL* has been rendering quality and materials. There is much talk and heated debate over which 3D program has the best-quality renderer, and while

XL had always been fast, it has not always had the edge in quality. The renderer has been significantly revamped in *XL 7* to address these criticisms, and indeed the new program has some extremely clever technology going on.

STRAP ON
The first big feature in the rendering department is the addition of Radiosity

> **FEATURES SUCH AS ROCK-SOLID STABILITY, A GREAT INTERFACE AND FAST RAYTRACING HAVE EARNED C4D INDUSTRY RESPECT**

and Caustics. Thankfully, Maxon hasn't simply strapped on an off-the-shelf Radiosity engine, but co-developed a system with Cebas (maker of *XL* and *3ds max* plug-ins). *XL 7's* radiosity is totally integrated into *XL 7's* rendering pipeline and thanks to its optimisation, it's one of the fastest Radiosity rendering systems we've seen.
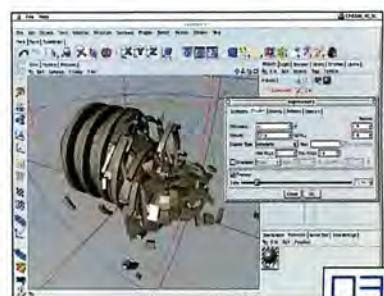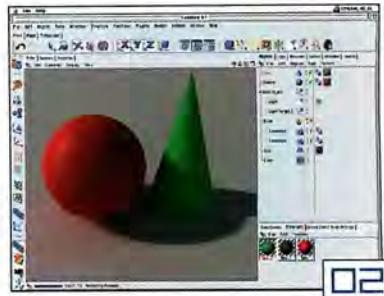
XL 7 enables you to finely control the way Radiosity is calculated, which does tend to make it very hands-on and often quite scene-dependant, but the speed gains are often worth the effort. There's a new Radiosity section – the Render Settings dialog, which itself has been totally redesigned with a better layout. Here you can enable or disable Radiosity rendering, and access the optimisation settings. At the top, there are Strength and Accuracy controls; the latter sets the overall quality of the Radiosity calculation while the former sets the intensity of the effect.

However, setting the Radiosity to 100% is a different kettle of fish. This disables any optimisation and provides you with a full-on Monte Carlo Radiosity render. In this mode, you can achieve Arnold-like Radiosity without too much fiddling. When set to any value below 100%, extra controls become active.

The optimisation process puts the Radiosity shading points only where they are really needed and this process is guided by the Min/Max settings. A prepass render displays white dots over the image showing each shading point. This enables you to better see how you
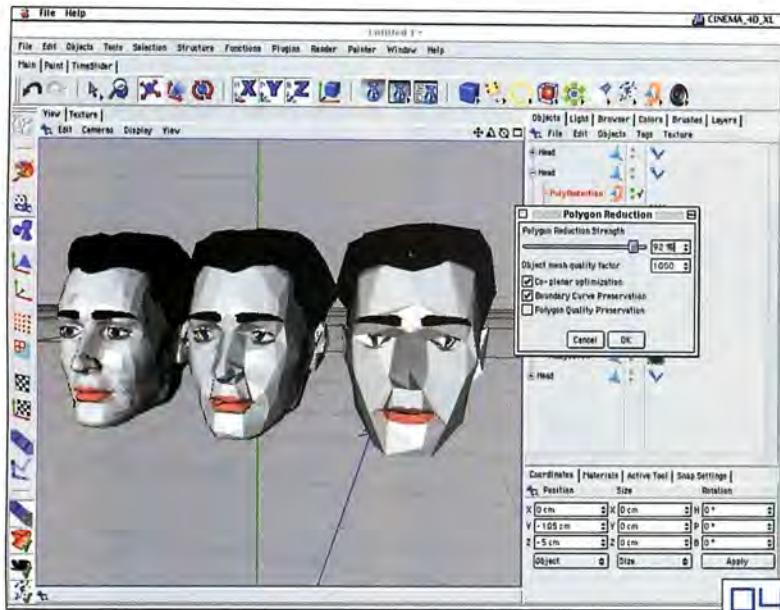
[04]

can improve the Min/Max settings and troubleshoot the render. To speed-preview rendering, the Prepass can be set to a fraction of the full render from a dropdown menu.

SHADING POINTS

When rendering using the optimisation in XL 7, the Radiosity shading generated by the shading points is interpolated across the objects surfaces, resulting in a close approximation of a full Radiosity render. The best quality can be achieved by getting as close to one sample-per-pixel in the image as possible (which can be done using the 100% Accuracy method), but huge amounts of time can be saved with minimal decrease in quality using XL 7's optimised approach.

The results are very good and even low-quality settings can, depending on the

scene, be used with great results. The Radiosity solution can be cached and subsequently reused for even faster rendering by enabling the Save Solution check box in the Radiosity render settings dialog. A Recompute pop-up menu offers options for XL 7 to recalculate the solution for every render, reuse a cached solution if there is one present or force XL 7 to use a cached solution even if a setting has changed. There's also a curious check box labelled Single Animation Solution. This is

one of the best features of XL 7's Radiosity because, when enabled, you can use this type of rendering for animations without having to recalculate the solution in full for every frame. What appears to happen is that the full solution is generated for the first frame then subsequent frames require only a few extra sample points, depending on what changes in the scene. The result is that unnecessary re-rendering of sample points is greatly reduced, likewise the rendering times. The resulting animation doesn't seem to suffer from flickering caused by random stochastic sample generation, which would occur if each frame's Radiosity solution was fully re-rendered.

Typically, a good-quality Radiosity render on a simple scene will take minutes in XL 7. It can still take hours for very complex scenes with reflection and refraction and very high Radiosity settings, but it still seems to be over all very quickly. The downside is that Radiosity setup can be very involved and it is also highly scene-dependent. The manual does a good job explaining the settings though, but a lot of experimentation is required to get to grips with how it all works.

GLASS OF BEER

The other new rendering feature is Caustics, which are defined per light,

[01] This scene is lit by a single light and ambient illumination is provided by a luminous skydome. Radiosity rendering took two minutes and 22 seconds on a G4 400.

[02] A prepass can be rendered when using Radiosity, showing you the distribution of sample points. This enables you to fine-tune the Min/Max settings of the Radiosity render.

[03] The ExplosionFX deformer can be used to create realistic fragments when destroying an object. The effect is live (you can move the deformer and the portion of the object affected updated in real-time) and has a vast number of controls.

[04] The polygon-reduction deformer can be used on any type of object and outputs a reduced-polygon mesh depending on the settings in its options panel.

[05] The new Render Tag is a rendering godsend. You can control shadow generation, ray visibility, Radiosity accuracy and activation, and anti-aliasing quality per object.


[05]

VOLUME CAUSTICS

XL 7 FEATURES not only surface caustics but volumetric caustics too. Volumetric caustics are cast within volumetric light cones and through refractive objects. A quick test with a transparent sphere and a volumetric light showed us exactly what volumetric caustics were all about. Projecting from the sphere to the caustic hotspot on the ground was a beautiful focused cone-shaped beam of light, in the shadow portion of the volumetric cone behind the sphere.

This capsule object is casting caustics through the visible, volumetric light cone. The photons create these patterns of light.

may feel rather overwhelmed by all the different controls.

The rendering engine in *XL 7* also sports a totally new anti-aliasing system, and this is probably the single most useful feature of the new version because it has huge implications for everything you render in *XL*, despite not being a headline-grabbing feature. Imagine being able to render the edges of all of your objects at 16 x over sampling but at the equivalent of 2 x speed? Well, that's just what *XL 7* does.

All edges of geometry are anti-aliased perfectly using the new Geometry anti-aliasing mode. The mode uses a special technique that adaptively renders the scene, only anti-aliasing the edges that need it. The result is razor-sharp, perfectly smooth edges and very low render times. There are limitations, however.

The Geometry mode does not take into account object edges behind transparent surfaces or in reflections. Most of the time this is not a problem in scenes that do not contain these types of object, though hard shadows are also not anti-aliased using this mode. When you need these things to be anti-aliased, you can switch to Best mode. This is similar to the old Edge and Colour method, but you can set a tolerance value and a Minimum and Maximum over-sampling value. The tolerance enables you to optimise the anti-aliasing further so that only edges that have a contrast above the tolerance are anti-aliased using the higher value. Best mode anti-aliases everything, edges and colours, no matter where they are.

FILTER SYSTEM

A second option in the Anti-aliasing section of the Render Settings enables

[□1] The Geometric anti-aliasing has its limitations. It doesn't work in reflections or behind transparent objects, something that Maxon will hopefully fix in an upcoming maintenance upgrade.

[□2] The new Multipass rendering is an excellent workflow enhancement. With minimal impact on rendering times, you will be rendering using Multipass all the time. Many effects and tweaks can then be done in a compositing program in place of you having to re-render.

[□3] This is an MP render opened in *BodyPaint*. Each layer is a component of the image, and there's also the full RGBA render to boot. There are also layers that help to isolate material properties such as colour, reflection, luminance, etc.

so you can have only certain lights casting caustic rays while others are not taken into account. There is also a global Caustics setting panel in the Render Settings dialog. Here you can enable or disable Caustics (Surface and Volume individually), set the overall brightness, and various optimisation values. As with Radiosity, the volume Caustics can be optimised by rendering volume samples at intervals and interpolating the points to create the final effect. Speed can therefore be increased by lowering the number of samples and increasing the size of the interval between them, and not always at the expense of quality. These can be defined using the Step Size, Sample Radius and Samples settings in the Render Settings. Again, as with Radiosity, you can cache Caustic solutions and also activate a Single Animation Solution for optimising caustics for animations.

Control of these rendering options is extended to materials which have a new Illumination section. Here you can

set Radiosity and Caustics options per material. So, if a caustic cast on an object is not being smoothed properly, you can increase the Samples just for that material.

CAUSTIC CONTROL

Again, all this control comes at the expense of simplicity. There are three separate locations where you control caustics: Render Settings, Light panel and Material Editor. However, as *XL 7* is aiming towards high-end rendering, this is the preferable situation for professionals but it does mean that less-experienced users

overall MIP filtering of textures, which is a very handy feature.

ANTI-ALIASING BOON

If that wasn't enough, *XL 7* has a new Render Tag for objects in the Object Manager. This has been much improved and now enables you to set anti-aliasing on a per-object basis. If a particular object is causing a problem, you only need to increase its AA setting using the Render Tag rather that using the global settings. The Tag also lets you enable and disable an object's visibility to the Radiosity rendering process, and as with anti-aliasing, you can force a higher or lower Accuracy per object.

The rendering improvements in *XL 7* are highly significant and compared to version 6, it feels vastly more professional. There's more though. Maxon has also added a fully configurable and automatic Multipass rendering option to *XL 7*. Along

you to choose different anti-aliasing filters from a menu. These are Still Image, Animation, Blend, Sinc, Area, Cone, Catmull, PAL/NTSC. Still is the default and produces the razor-sharp edges in *XL 7*, while Animation is a softer version. Blend enables you to vary the softness based on a value you enter (0 to 100%), while the others provide a variety of different looks for different situations. Below all the new AA stuff is a single MIP scale field. This enables you to scale the

with the normal way to save images and alpha channels, there is now a Multipass section in the Render Settings. When enabled, you can choose exactly which channel you want to render separately from a long list. Along with Reflection, Diffuse, and Specular channels, you also have Radiosity, Caustics, Atmosphere, Illumination and Material-based channels (Material Specular, Material Diffuse, etc). You can save a Multipass render as separate files, a *Photoshop*-layered PSD file, or better yet as a *BodyPaint*-layered file which more accurately stores the Multipass layers.

This is matched only in high-end apps such as *Maya* and *Softimage|XSI*. Though

[04] The new material system includes much improved Specular highlight control. Pin-prick highlights are now possible, as are extremely broad ones.

[05] *SLA* can be used to create Anisitropic specular highlights. Most of the 3D shaders have this option, and here it's a Danel shader. The surface is created using only this single shader.

[06] The *SLA* shader system is bundled with *XL 7*. The system can be used to create limitless shader trees by stacking shaders on top of one another.

BETA TESTER SPEAKS!

JEFF JOHNSON of Hybrid Medical Animation, who has been using the beta of *C4D XL 7* for three months, has this to say about it:

"The best thing about the *XL 7* is the fact that when combining the new Explosion plug-in with the noise deformer, you can really get some cool things to occur, including big organic 'chunks' and not polygons. There's also the ability to create organic shapes with relative

See Jeff's work at www.hybridmedicalanimation.com.

ease and then make changes and tweaks at virtually every stage of creation. It's very user-friendly and adaptable. *Body Paint* and *NET* make *XL* that much more fast and powerful as well. *NET* is one of the most useful tools since 3D itself. Also, I'm always impressed with the unrelenting development of *XL* – Maxon makes *XL* a much better piece of software with each new release – that's a valuable attribute for a 3D package," he says.

What does Jeff consider to be *XL 7*'s weaker points?

"If I was compelled to pick something, I would would like to see the timeline be a little less cumbersome and easier to use – more like the *After Effects* timeline, for example. It's close, but it could use a little more fine-tuning. Otherwise, with release 7, Maxon has really addressed my other main concern by really enhancing the rendering quality. *XL* enables a huge amount of ability to customise and tweak a render setting – and inexperienced users often fail to make use of that feature or recognise it as an advantage. Regarding the next version, I'd like to see the ability to incorporate physics for inertia, collision detection, etc, and soft-body dynamics," Jeff concludes.
www.hybridmedicalanimation.com

ElectricImage has a very good multipass rendering system, it can't render out layered files like *XL 7*. *XL* has the trump card though, because you can also render out each and every light in a scene as separate layers. In a layered file *(BodyPaint* or *Photoshop)*, light passes are contained in folders. Don't like a light? Then turn its layer folder off. Light too dim? Simply duplicate the layer folder and adjust opacity to taste.

SHADOW PASSES

There are some limitations with the system, notably with shadow passes which can show gaps where they meet objects due to the anti-aliasing filtering. There is a switch to minimise this effect, but it can still be a problem. However, you can still render out the full RGBA
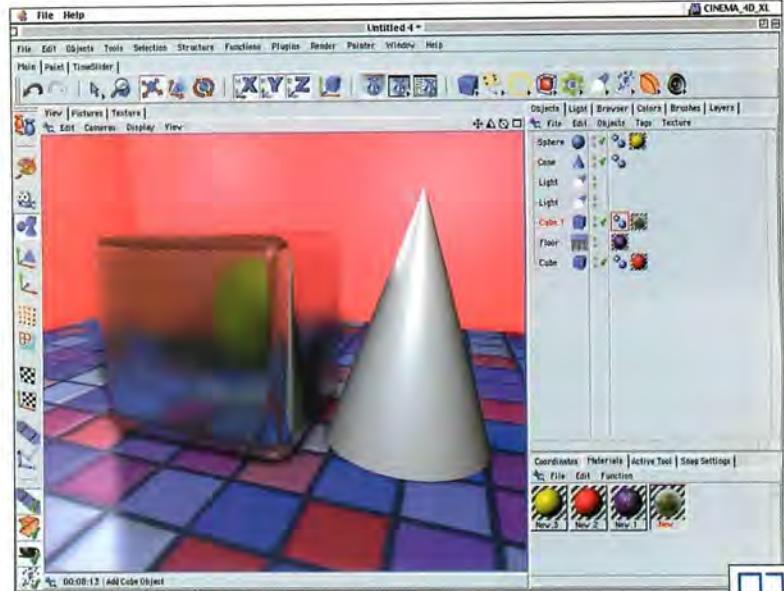
01

THE RENDERING IMPROVEMENTS IN XL 7 ARE HIGHLY SIGNIFICANT AND COMPARED TO VERSION 6, IT FEELS VASTLY MORE PROFESSIONAL

[01] A new feature is blurry reflections and transparency. This uses true raytracing techniques to produce the blurry effects which are very accurate but can take a while to render.

[02] There are three Illumination models on offer for materials: Phong (the standard model), Blinn and Oren-Nayar. Each are good for different types of surfaces.

[03] *Smells Like Almonds* shaders include a set of 3D shaders that are totally self-contained. Here you can see Danel, Nukei, Cheen and Banzi rendered – the interface is for the Danel shader.

[04] The new anti-aliasing is fast and produces very clean renders. The Geometry setting anti-aliases all geometric edges using 16 x oversampling yet takes less time to render.

image, and what you gain with MultiPass far outweighs this small limitation.

The material system in *XL 6* was its weakest link. In *XL 7*, there have been some additions to the system such as new illumination models (Blinn and Oren-Nayar) with diffuse drop-off controls and the new Illumination section for Radiosity and Caustics. Improvements to the basic material system also include blurry reflections and transparency. These effects are realistic but can be time-consuming to render, though as with the rest of *XL,* you can adjust the settings to give you speed over quality. There is also a superb new

Specular highlight section that has four sliders (as opposed to two previously) for Height, Width, Fall off and Inner Width, probably the most flexible specular control yet. To give the material system a real boost, *XL 7* ships bundled with the full *Smells Like Almonds* stackable shader system. When we reviewed it previously (*3D World* issue 6), we gave it five stars because it makes the basic material system an order of magnitude more powerful.

The system includes 2D and 3D shaders that integrate seamlessly into *XL 7*. Shaders include Brightness and Contrast, Hue (for HLS colour control) and Fusion for blending multiple shaders or textures in a single channel. There's also Lumas, which adds three layers of specularity to materials, and Distorter for distorting one shader's output based on another shader.

The bundled edition is actually version 2.5 of *SLA* and there are some fantastic

02

03

04

SPEED TEST SPECIFICATIONS

WE RENDERED SOME of the scenes on the XL 6 CD using XL 7 and XL 6.2. The results are interesting – some scenes show significant improvements while some are slower using the default settings in XL 7. However, in every case the quality in the XL 7 renders is better. When using Best Anti-aliasing mode you will often need to tweak the settings to get the best speed for the scene.

The machine used was an IBM 6866 1GHz PIII Xeon with 512MB RAM.

MOBEL (C4D ART CD)	TIME
XL 6 edge 4x4	38s
XL 7 geometry (still filter)	15s
EXPLOSION ANIMATION	**TIME**
XL 6 edge 4x4	1min 9s
XL 7 geometry (still filter)	52s
RAYTRACE SPHERE SCENE	**TIME**
XL 6 edge and colour 3x3	22s
XL 7 best 1x1 – 4x4 10% threshold	30s
XL 7 best 1x1 – 2x2 20% threshold	19s (optimised render)

improvements. That it is now free with XL 7 makes it almost worth the upgrade cost alone, but it was a bargain when it was sold separately. To complement the new shaders, XL 7's material channels are now unclamped. That means that you can have reflections and luminosity brighter than 100% (up to 10,000%, in fact), essential for full artistic control over the look of surfaces.

DEFORMER ON STEROIDS

Though the modelling has not been touched, there is a new ExplosionFX deformer. This is like the old Explosion deformer on steroids. It can create chunks of your object that have thickness, blow them out using a huge number of parameters including Gravity and wind, make them spin and dissolve them to nothing over a certain time. By using selection sets, you can design your own fragment shapes for precise control, or let the deformer do it automatically.

Another new deformer, though that's not strictly the right term, is PolyReduction. It works like all the other deformers – ie, it's part of XL's live-modelling pipeline so you can always re-edit the reduction parameters – and your full-res object is always retrievable. In use, it worked very well and never

caused XL to crash or hang even on very dense models.

XL is fast becoming a major contender in the professional 3D world. The new rendering features push well past the competition in certain areas, though there are many that may still be put off by the look of the renders. This has more to do with the default settings than anything else because with a little effort and understanding, you can get truly stunning results that were not possible before. The added control of Multipass and Radiosity make it a very difficult package to beat at the price.

OUTMODED TOOLS

Where XL 7 is lacking is in the character-animation department, where its tools are beginning to look a little outmoded, and it's certainly bettered by the competition in this particular area. On top of this, animators have to contend with motion channels that are still not independent, which is probably the worst thing about the program.

That said, the new features are very impressive, especially when you consider that it has been only eight months since the last major release. The new Radiosity and Caustics are excellent, though a little complex. The anti-aliasing is superb and

the bundled SLA system is a very smart move by Maxon. When you buy XL 7, you also get a three-client licence of NET, the distributed rendering system.

If you need a rock-solid 3D program that can do the bulk of 3D work very well, very fast and with the minimal of fuss, then XL 7 will be a real delight and well worth the investment if you're serious about Radiosity and Caustics.

Keep an eye out for the next edition of 3D World (issue 15), which will include a demo of Cinema 4D XL 7 on the coverdisc as well as a four-page tutorial.

3Dworld Verdict

★★★★★

PROS
• Fast Radiosity and Caustics • Excellent interface • Integrated environment • *Smells Like Almonds* shaders • Fully extensible

CONS
• No independent motion channels • Character animation and IK could be better

an introduction to NURBS

You use NURBS daily in all areas of 3D CG, but do you really know what they are? **BY MAT BROOMFIELD**

PRICE £35 (US $50)
- Author: David F Rogers
- Publisher: Morgan Kaufmann
- Contact: 001 (415) 392 2665
- Web: www.mkp.com
- ISBN: 1558606696
- Pages: 300

NURBS – or NonUniform Rational B-Splines to give their full title – are a special type of curves that have revolutionised engineering and CAD/CAM, and more recently, computer graphics and animations. They are a way of representing complex curves in 3D dimensions that encompasses many other curve-modelling systems. In other words, NURBS are a virtually all-inclusive way of representing every type of curve using a single mathematical model. The trouble is, that model is still the subject for constant research and revision, so it comes as little surprise to discover that most people don't understand the underlying mathematics.

In this book, David F Rogers attempts to shed some light on the subject without miring you down in a swamp of corrolaries and addenda. However, you'll need good A-Level maths or beyond to understand it because it's heavily illustrated with formulae, and uses mathematical language virtually from the word go to talk about the various concepts. As David writes, 'this is no NURBS for dummies'.

Despite the complicated maths, this is a thoroughly well-planned and written book and David has a gentle sense of humour. So often, technical books are born out of a deep love for the subject rather than a strong to desire to clarify that subject for others, resulting in stream-of-consciousness writing that makes for very difficult comprehension.

However, in this case, the book is broken down into logical chapters, complete with tension-relieving historical perspectives at the end of each section. There are even questions at the end to test your understanding, and a pseudo-code example, with real code versions available on the Web site. The algorithms are also fully listed.

The book starts with Bezier curves and progressively follows their evolution, progressing through B-Spline curves, Bezier surfaces, etc, before concluding with Rational B-Spline surfaces. This is not so much a book to read in a single sitting then forget than a book to be slowly digested over a month with a pen and paper to hand, then stored for permanent reference. It's not going to help *Maya* users build better models, but if you write 3D modelling systems, or you animate using B-Splines or NURBS, then this will enable you to fully understand some of the tools.

3Dworld Verdict
✖ ✖ ✖ ✖ ✖

an introduction to implicit surfaces

Thanks to implicit surfaces, you can enjoy new capabilities for modelling objects **BY MAT BROOMFIELD**

PRICE £47 (US $40)
- Author: Various
- Publisher: Morgan Kaufmann
- Contact: 001 (415) 392 2665
- Web: www.mkp.com
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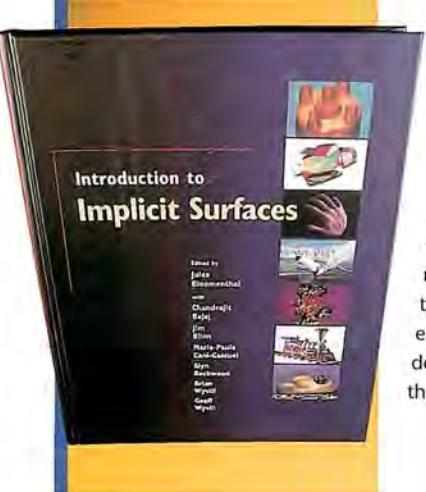
Whether you're an animator, a CAD designer, a model-maker or a graphic artist, implicit surfaces can change the way that you draw, design, render and animate. They can easily describe intricate, smooth shapes that are part of articulated models whose surface topology may change during animation. Unfortunately, as with so many areas of 3D modelling, they're not the easiest thing in the world to understand.

As with *An Introduction to NURBS*, you're certainly going to need a very solid grounding in maths, 3D modelling and topology to understand it. The very first example in the book took half a dozen readings to make sense of, and things became more complicated from there throughout the first chapter, with fairly heavy mathematical equations and comparisons littering every page.

The sections are written by different experts in each field, and although this might result in a mish-mash, it actually works in your favour. After the first section, things get better, and the subsequent ones are somewhat easier to digest, so that by the time I'd progressed through The Algebraic Properties of Second-order Surfaces and Implicit Surface Patches, to Ray Tracing Implicit Surfaces and Convolution of Skeletons, I started to feel on a bit more familiar territory. Moreover, the writing style was somewhat more accessible and literary, rather than decidedly scientific as it started out.

The book is heavily peppered with appropriate illustrations, and a colour section in the middle. These really help to elucidate what is, after all, a complex subject. Unfortunately, this book is overly scholarly in style in some chapters, and the language itself often adds to a sense of confusion.

At four years old, this book does not fully reflect the latest advances in the field, although it does have a support Web site, which helps. It varies between being inscrutable and highly interesting, but it really isn't one for the average 3D designer. However, if you program 3D systems, it will give you a fascinating and beneficial insight into the fundamentals of your craft.

3Dworld Verdict
✖ ✖ ✖ ✖ ✖

dvGarage Surface Toolkit Vol 1

Add a layer or realism to your work with a little bit of urban decay

BY STEVE JARRATT

PRICE £155
$249

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MAIN FEATURES
- 166 2,048x2,048 grunge maps in *Photoshop* format
- Extensis Portfolio Browser
- Nine video tutorials plus various support files
- 34 Attention to Detail video tutorials highlighting the effects of wear and tear on real objects

[01] A clean wood surface texture map. However, it's just a bit too clean…

[02] A flat, black logo is applied and grunge maps used to break up the surface, creating holes and adding a blurry stain where the paint has soaked into the wood.

[03] The texture is dirtied up with another grunge map, applied with a gradient so that just the edges are made grubby.

[04] Additional darkening is applied to the very edges of the texture, and an overall layer of grime and scuff marks added to finish it off.

[05] And here's the finished render, complete with weathered texture map and bump maps. Pretty realistic, eh?

[06] Extensis' Portfolio Browser lets you select a map, but the thumbnails are all very small and often quite similar.

The *Surface Toolkit Vol 1* is, essentially, a large collection of hi-res (2,048 x 2,048) tiled 'grunge' maps in *Photoshop* (PSD) format. These greyscale image maps – some 166 in total – are designed to help bring an added level of realism in 3D work, though it's certainly not hard to see how they could be used in a similar fashion with any 2D illustration.

These relatively simple image maps have a multitude of uses. By applying the images directly as diffuse, specular, reflection and bump maps, it's possible to rapidly 'dirty' up a 3D model, creating much more realistic surfaces for your objects. The images can also be used to add everyday dirt and grime to your existing colour maps, applied as a displacement map to break up existing textures, or used as selections/alpha channels to remove parts of the image in an organic, distressed manner. Blurred grunge maps can also be used to displace

3D meshes, again to produce realistic, organically random shapes.

Of course, the *Surface Toolkit* images can also be combined in many different ways to create an infinite number of new grunge maps. By modifying their greyscale Levels or adding blur, you can also subtly alter their characteristics to varying effect. When applied in the right way, these maps do help to bring an added level of realism to your work, and prevent reliance on built-in procedurals.

However, there's certainly a degree of experimentation required with your 3D app before replicating the examples provided on the disc. You'll also need to convert them to a suitable format before applying them, depending on your host program.

GRUNGE STOCK

Obviously, it's taken some time to prepare all 166 grunge maps and generate the requisite greyscale images then tile them perfectly, and on that basis this is an accomplished collection. However, the presentation is somewhat lacking. Extensis' Portfolio Browser gives you rapid access to thumbnail images, but it's often difficult to differentiate between them, and since the grunge maps are labelled dvGSTK_001 through 166, you don't get much of a clue as to their original source or potential application.

Similarly, the tutorials (there are nine in all, with associated PDFs and source files) are very polished but all too brief, and only really scratch the, ahem, surface of what's achievable with the Surface Toolkit. Not only that, but they're all

currently available on the dvGarage Web site and downloadable for free. Without any exclusive tutorial material, this leaves the *Surface Toolkit* a rather pricey collection.

It's not inconceivable that a decent digital camera and some time spent in *Photoshop* would yield equally useable results, but for those who have no inclination to create their own grunge maps, or busy studios looking to build a resource library, there's no denying the overall usefulness of this collection.

3Dworld Verdict

★★★★☆

PROS
- Extensive library of grunge maps • Lots of varied applications for 3D and 2D work • Professionally created and tiled

CONS
- Many maps are very similar • Tutorial material not exactly comprehensive

Amapi 3D 6

Web 3D output and more modelling tools feature in the latest version of *Amapi* **BY SIMON DANAHER**

PRICE $399

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- 24-bit colour display
- CD-ROM drive
- 100MB free hard drive space
- 3D graphics accelerator card recommended

Macintosh
- Power Macintosh G3 266MHz or better
- System 8.1 or later
- 64MB of application RAM
- 24-bit colour display
- CD-ROM drive
- 100MB free hard drive space
- 3D graphics accelerator card recommended

MAIN FEATURES
- Polygon and NURBS modelling
- 3Space Web 3D animation output
- Web 3D features special effects and object physical properties
- Subdivision Surfaces modelling
- Polygon reduction
- Improved smoothing tools
- Improved material system
- New primitives
- Spherizer deformer

ost 3D aficionados will be familiar with *Amapi*. It's a 3D program that sticks out from the crowd due to its unique interface and modelling methods, which are far from the norm. This new version adds some interesting new features to an already interesting package.

Amapi uses a single 3D view for displaying scenes, which takes up the entire monitor save for a strip at the top and bottom containing tool information and viewing controls. You can also find link tools, ghosting options and the like here, but the main toolset is displayed in an arc of floating 3D icons at the top-right corner and side of the interface. Flicking your mouse off to the right swaps the set of tools displayed. If you watch an experienced *Amapi* user working, it looks like they have some sort of twitch, but they're simply finding the right tool.

Amapi 3D 6 maintains this interface that is its trademark, and a good thing too because by and large it does work well. Having a single view can pose problems, especially when it comes to accurate placement of objects. *Amapi* has an axis graticule that appears when drawing curves or polys, or sculpting or moving objects that are locked to two axes. Rotate the view (using the cursor keys) and beyond a certain point, the axes switch to another set. At any time, tapping the space bar constrains actions to one of the two displayed axes. In this way, it's easy to put points where you need to or draw accurate models simply by rotating the view.
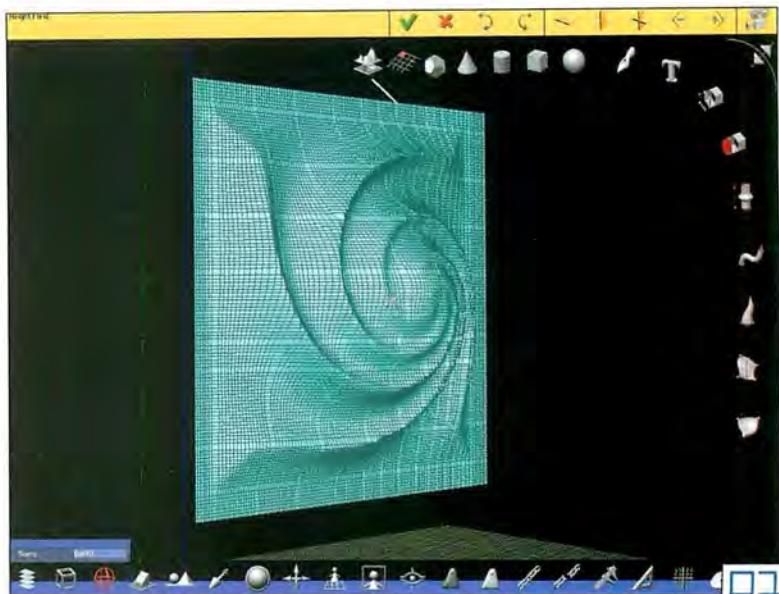
SMOOTH OPTIONS

Amapi has always been an excellent modelling tool, though a little unstable at times, and the new version continues in this tradition by adding further modelling refinements and tools. *Amapi* features Subdivision Surfaces modelling (SDS) and the new version has improved this with better Subdivision smoothing options, including the ability to add tension or

[04]

MATERIAL MAKEOVER

THE MATERIAL MANAGER has received a whole new makeover, but the changes are not only skin-deep. The material system, which is as bizarre as the rest of *Amapi*, feels more responsive and seems much easier to use and understand. Though you can use bitmaps to control most of the material channels, *Amapi* has a shader system for creating various fractal patterns, wood, marble, etc, and a texture-layering system that can achieve fairly complex results.

The new system is a worthy addition to the program, not least because the previous incarnation was so clunky.

The new material interface is easier to work out than before. Despite being a cosmetic overhaul, things seem to work more predictably too.

[01] The new Height Field can be used to convert a greyscale image to a polygon object. Each pixel is converted to a polygon based on the brightness.

[02] When using the Smoothing tools (SDS), you can define which edges you want to remain unsmoothed. These are marked in yellow on the object. This adds flexibility to SDS modelling.

relax a mesh at selected edges or in its entirety. There are also global extrusions, enabling you to model a pitted golf ball from a simple sphere object by extruding the faces.

Deformation has been improved too. There is a set of new deformations tools that wrap objects to a sphere, cylinder or plane and can be used interactively on models. A further deformer, the Height Field, enables you use a bitmap image to distort an object. Another special deformer is the Spherizer, which can be used to pucker or bloat an object.

THE MOST EFFORT, IT APPEARS, HAS BEEN PUT INTO THE BRAND-NEW WEB 3D EXPORTING SYSTEM CALLED 3SPACE

[03] 3Space is *Amapi's* Web 3D export system. It requires a browser plug-in for viewing the results but you can achieve some fairly complex 3D effects and animation including dynamics. However, the 3Space interface in *Amapi* leaves a lot to be desired.

[04] Bump/Unbump enables you to increase or smooth the surface displacement on an object.

Extra primitives have been introduced in *Amapi 6,* which is always a bonus. As with the Height Field deformer, there is a primitive which takes a bitmap and converts it into a polygon object based on the brightness values in the image. A useful addition is the polygon-reduction tool. However, it tended to be very slow and on more than one occasion hung the machine while trying to reduce a moderately dense mesh.

Rendering in *Amapi 6* is very good, though not earth shattering. It has a healthy raytrace-rendering engine capable of good-quality output, though there could be better control of anti-aliasing.

The most effort, it appears, has been put into the brand-new Web 3D exporting system called 3Space. This is a separate environment that you access from within *Amapi* much like the material editor. You get a small preview window flanked by the system controls and options and the whole thing is overlaid on top of the main 3D view. It would look neater and provide more flexibility if the whole thing was in a separate interface with an adjustable view size, but that's *Amapi* for you.

INTERACTIVE VIEW

The 3Space system takes your *Amapi* objects and converts them so that they can be viewed in a Web browser in glorious interactive 3D. It uses the ZAP format to store model data and XML and requires, as with most Web 3D systems, that the viewer downloads and installs a free browser plug-in.

However, that is not the end of the story. 3Space goes further by enabling you to link events to your objects when the viewer interacts with them in their Web browser. A mouse-over could cause the object to spin, bounce or even catch fire. A library of effects are on offer which can be assigned to your objects and triggered. But there's more. 3Space can also perform dynamics simulations. You can assign mass, friction, drag, etc, to objects and then 3Space will calculate their behaviour.

There's lots to like about *Amapi*. For modelling, it combines Polys and NURBS and SDS in a unified environment that works well and ships with hundreds of 3D objects too. However, the program is compromised by its tendency to crash. Also an inexcusable bug prevents you from opening any *Amapi* document that has been saved. Quite how this one slipped by is anyone's guess because it's a fundamental requirement to be able to open your work. You can Import the scene just fine so it's not as desperate as it at first seems, but it doesn't inspire confidence.

Despite the glitches, working in *Amapi* can be fun and productive (if you can keep the program from falling over). Rendering and texturing are not quite so impressive and animation is more or less an afterthought, but the 3Space output is a decent addition.

3Dworld Verdict

✖ ✖ ✖ ✖ ✖

PROS
• 3Space Web 3D output • Decent modelling environment supporting NURBS, polygons and SDS • Enjoyable to use

CONS
• Crashes too easily • Interface can be poorly designed at times • Lights are not very flexible

Merlin 3d

Is this Digital Immersion's first real attempt to enter the professional 3D market? BY ROBERT MITCHELL

PRICE Merlin 3d $595
Nav 3D controller $395
Bundled together $795

SUPPLIER
Digital Immersion Software

CONTACT
001 705 522 7991

WEB
www.merlin3d.com

MINIMUM SYSTEM
- Pentium 2 or AMD K6
- 64MB RAM
- 250MB HD
- Windows 95
- 8MB Direct3D videocard
  supporting 1,024x768

MAIN FEATURES
- Fast real-time render
- Lightworks render engine
- Good object-import support
- Radiosity
- Inverse kinematics
- Subdivision surfaces

At $595, Merlin 3d finds itself in the mid-range market for 3D software, probably one of the most cut-throat sections of the market. So can it stand up to the rest, or even better, stand above them? Opening M3d reveals a sparse working environment. The near monochromatic UI is clean and uncluttered. Nearly all of the tools and modifiers can be found in a stack of five tabbed panels lined up along the left side of the screen by default. As part of the UI customising features, these panels can be torn off the stack and floated anywhere on the screen. The main window can also be split into four views.

Under the tool stack is a small, non-scalable viewport that can be set to any view, useful for a scene overview. Some of the tool panels or options boxes seem a bit too large for their task. One that stands out is the render options panel, which is

COURTESY OF: Digital Immersion Software © 2001 by Terry Cotant Head geometry thanks to 3D Cafe's VIP Lounge

[01]

AS A MODELLING TOOL, M3D OFFERS POLYGON MODELLING, BUT NO NURBS

approximately a third of the screen size. Initially, the panel seems to have more blank panel surface than options buttons. A few clicks will reveal the reason for the space. M3d uses the Lightworks PRO 5.6 render engine, which comes with the associated trimmings of back/foreground, post-process shaders and radiosity

[01] This shows a form of Image Based Lighting, performed using the current 1.0 release of Merlin 3d with no additional add-ons or tools. The actual light source was a large sphere turned into an area light, and inverted so the light shines 'in'.

[02] This is the main box art for Merlin 3d. Andrew Moffitt was commissioned to produce this for Digital Immersion.

COURTESY OF: Digital Immersion Software © 2001 by Andrew Moffitt

[02]

options. Group these with render-type settings, animation, render output formats and the choice of panel size is clear. It would have been good to see this and the rest of the options panels as stackable too.

Lighting comes in the standard forms of spots, directional, projector, point and area light, the latter of which can be assigned to an object, but can be detrimental to render times if used on high-poly objects. The on-screen representations of spot, directional and projector sources are identical and easily confused, and the modify panel shows immediate differentiation only by text description. Light settings include several quality options for resolution, softness, tolerance and transparency for raytracing

or shadow mapping. M3d's exclusion of real-world lighting data import might rub against the realism aspirations for architects, but the overall lighting control is impressive.

GEARED UP

For presentation, M3d is geared to run in DirectX solid preview. No OpenGL effectively rules out users running under WindowsNT. A high-level solid preview performance is boasted for M3d with real-time textures of up to 2,048 x 2,048 without much loss of manipulation speed. A justified claim. However, wireframe modelling seems to drop in performance on high-poly scenes. Unfortunately, there is no wireframe over the solid capability.

As a modelling tool, M3d offers polygon modelling, but no NURBS. There are a fair number of edit and modify tools, including bend, twist, taper and shear, to mention a few. However, some of the more obvious tools aren't there, such as the ability to add or delete edges or vertices, which is plainly a negative point for serious organic modelling. The fact

that *M3d* has Subdivision surfaces just gives lip service to the soft modelling field. As a plus point, there are a couple of innovative profile editors that, via a small modifier window, enable profiles or sections to be altered or created on primitive objects, which is useful for roughing out geometric shapes.

The stronger hard-edged modelling capabilities, coupled with an Autodesk import engine – which suggests smooth import of DWG, DXF and *3ds* files – tend to lean *M3d* towards AEC and MCAD users either as an import and render tool or a construction arena. Access to object surfacing is via the Paint tab in the side tool stack. *M3d* comes with a good selection of basic materials, both bitmap and procedural. Procedurals are limited to the Lightworks Shaders, and no custom

shaders are included. Textures can be imported as original, greyscale or inverted – useful for creating bumpmaps. One serious drawback is the inability to layer materials and create subtle blends.

Animation tools are not very advanced but do include Inverse Kinematics, deform animation, keyframe editing and spline paths. Output is limited to AVI, though you can output to a series of bitmapped files as well. One cool feature is the integration of Digital Immersions' hardware navigation tool. Piloting the device does take some practice, while presentation walkthrough animations are fast and easy to record as all the input via the optional Nav 3D controller can be seen and recorded in real-time. Nevertheless, a couple of additional features, such as using the mouse to

ANIMATION TOOLS ARE NOT VERY ADVANCED BUT DO INCLUDE INVERSE KINEMATICS, DEFORM ANIMATION, KEYFRAME EDITING AND SPLINE PATHS

rotate the camera and mouse wheel to zoom could be a good touch – though rotation is possible using the Nav 3D device. As an overall package, *M3d* does offer an intuitive way of creating and presenting final designs, but by being promoted as a complete modeller, animator and renderer, Digital Immersion may have spread *Merlin's* magic just a little bit thin. OK, all the bases are covered, but there's something lacking in the depth, details and control. As a young company, Digital Immersion has made a brave effort entering this section of the market. If aimed predominantly as a visualisation tool, *M3d* will be accepted by a variety of upcoming design houses. **3D**

NAVIGATION INTEGRATION

ALONGSIDE THE RELEASE of *Merlin 3d,* Digital Immersion offers its navigation tool, the *Nav 3D* for a bundled price of $795. *Nav 3D* is designed as a scene object manipulation aid. Gently twisting or pushing the *Nav 3D* gives movement in the x, y and z-axis of the workspace. *M3d* is still perfectly operational without the *Nav 3D,* but its excellent integration into the software offers several advantages. Working in conjunction with the mouse,

workflow is significantly increased. Another advantage of using the *Nav 3D* is the ability to record live camera movement, specifically for walkthroughs or live demonstrations. The recording can also be an editable spline path.
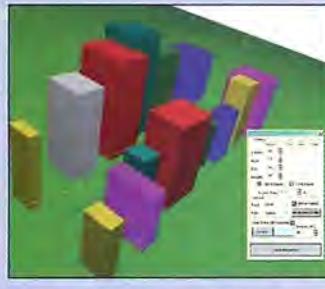
3Dworld Verdict

✖ ✖ ✖ ✖ ✖

PROS
• Fast real-time render • Good lighting options
• Fast learning curve • Modest minimum system specs

CONS
• Toolsets a little shallow • No OpenGL • Limited shader options

Kelseus Cloth

Can Kelseus' cloth-simulation plug-in stand its ground against the competition?

BY PETE DRAPER

PRICE £399
$599

SUPPLIER
Kelseus Limited

CONTACT
+44 (0)1223 471 224

WEB
www.kelseus.com

MINIMUM SYSTEM
- 300MHz Pentium II
- 128MB RAM
- 300MB swap file
- Windows 98/NT4/2000
- 5MB hard drive space
- *3ds max 3.1* or *4*
NOTE: Windows ME and 95 are not supported

MAIN FEATURES
- Caching
- Collision detection
- Uses *max's* own space warps
- Recalculation reduction locking
- Follow Mesh constraint
- Fabric library

Over the past few years, there have been numerous cloth simulation plug-ins released by various companies all claiming to have the most effective simulation, the most recent being *Cloth* from Kelseus. But can it stand out from the crowd and follow in the footsteps of plug-ins such as *ClothReyes*, *Stitch*, the free *SimCloth* plug-in and *MAXScript*?

Cloth's main bonus point is its simplicity, especially comparing it to *ClothReyes*, which is slow to update and slightly cumbersome to use. But simplicity does not mean that it is an inferior product, quite the opposite in fact. The collision detection is exceptional and the ability to bind the cloth to another translating object works very well. With most cloth plug-ins, if a setting or two is modified, then the entire scene has to be recalculated. Not so with *Kelseus Cloth*.

The ability to lock ranges of frames so that only those required are recalculated is ingenious. The recalculation method can be set so that it only updates on frames that you require, such as if you click on the play button in *max* or scrub the time slider bar across to a certain frame, *Cloth* will only update between the frames

THE ABILITY TO LOCK RANGES OF FRAMES SO THAT ONLY THOSE REQUIRED ARE RECALCULATED IS INGENIOUS

[01] By using collision detection and the Follow Mesh feature, *Kelseus Cloth* can perform exceptionally accurate simulations on translating and deforming objects, and even on low-poly objects.

[02] *Kelseus Cloth* can use *max's* own Wind and Gravity Space Warps. Here a cloth simulation using *max's* Gravity Space Warp is assigned to the *Cloth* modifier with collision detection on the table.

selected and not the entire animation. Very handy.

HANG UP

The feature to hang the cloth on a character or object has also been introduced, as has the ability to view faces that intersect the collision object(s) on the first frame so the positioning can be amended and the simulation correctly calculated. *max's* Wind and Gravity Space Warps can be used with the modifier; all parameters should be set within the Space Warps and then they are simply introduced into the plug-in's rollout.

Once all the parameters have been set, *Cloth* can store fabric types to a library for future simulations.

However, there do seem to be one or two minor flaws in the plug-in, although Kelseus reports that these are mainly due to *max's* architecture and are not the plug-in's fault – namely the fact that if the *Cloth* modifier is deleted, it sometimes cannot be re-assigned until the Cloth motion controller is deleted from the object's properties in the Motion Tab.

Also, there does seem to be a problem opening up non-cached scenes in *max 4* that have been previously created in *max 3*, mainly due to recompilation problems with *max 4's* SDK, although an update should be on its Web site by the time this article goes to print. Kelseus also

recommends that to fully optimise recalculation speed of cloth on deforming meshes such as characters, you should clone the mesh that the cloth is to drape over and delete parts of the mesh which the cloth will not touch. It's not exactly a proper fix, but works well nevertheless.

It is noted that Kelseus is aware of any major problems and plans a few additions to the next incarnation, the highlight of which is tearing, which seems to only be present in *ClothReyes*. The beauty of *Cloth* is its simplicity and speed, so comparing it with other more complex cloth simulation plug-ins doesn't really do it justice.

3Dworld Verdict

★★★★☆

PROS
- Exceptionally realistic simulation • Fast calculation speeds • Caching of simulation
- Ability to store settings in a library

CONS
- Removal and re-assignment of modifier problems • Caching for real-time playback

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The School of Television and Imaging, Duncan of Jordanstone College of Art
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CONTACT: Joanne Coull
T: +44 (0)1382 345 250
E: enquiries@imaging.tvi.dundee.ac.uk
W: imaging.tvi.dundee.ac.uk/softimage

WHAT DO YOU DO, THEN?

MANNY PAPAMANOS
Graphics Support Engineer
Softimage, Montreal

At school, I had worked countless hours to come up with a decent demo reel and it paid off. My first job is where I really discovered the ins and outs of 3D graphics. Other than the software itself, you also discover complex compositing and old-school IRIX stuff.

I've been working for Softimage in Montreal for the past two-and-a-half years. After about five years in production, I decided to make a leap towards working as a graphics support engineer. It takes lots of patience and practice. You have to realise that for an artist to get off from their project and dial a 1-800 number they've come to a complete cul-de-sac. It gets really interesting because you're always on the forefront of technology and constantly exposed to new tools that were never before available.

The role consists primarily of finding solutions to problems. You start by investigating, and usually the problem is related to usage. Other times you've exhausted your research and have to come up with a logical workaround, and chances are you've already dealt with this at one time or another and the response is automatic.

You also get to help out extremely talented artists and troubleshoot scenes that eventually make it to the movies or broadcast. It's quite rewarding. You also consult with all the talented people that helped in the development of *XSI*, which helped me understand *XSI* in great depth. Without a doubt it kicks butt.

I usually stress one thing to newbies in the field, which is not to feel too comfortable in their work environment, as the job never consists of just doing the work and getting paid for it. You always have to go a step further and analyse new tools and create your own complex scenes, because chances are you're in charge of a specific task in a production that you can't necessarily call your own and at times can't use on your reel.

Many believe that there is a great deal of stress involved with this position but I've been under more stress and pressure in production environments. One of the great perks is that I'm free to work on my own personal projects when I'm not actually busy on the job or on research.
CONTACT: mpapama@softimage.com

MOVERS

Sheffield's **ZOO** has followed up its recent takeover of **KAZOO 3D** with the announcement that has bought the business assets of **STARTLE**, a digital service provider with interests that include the Web, CD-ROM, interactive TV and touchscreen kiosks.

EYETRONICS, maker of the **SNAPESNATCHER 3D SYSTEM**, has signed Jadason as a reseller to the Asian market. The company has more than 30 engineers to provide support for Eyetronics' product line.

REALVIZ has appointed **PATRICK DUMA** as CEO. He previously worked as head of the company's Online Solutions division.

FRAMESTORE has announced the promotion of **MARKUS MANNINEN** to Deputy Head of 3D. The appointment follows Andrew Daffy's promotion to Head of 3D Commercials. Elsewhere in the company, Henry operator **PAUL O'BRIEN** has joined the post-production facility, while **STEPHANE ALLENDER'S** arrival has boosted the company's team of *inferno* artists.

New Zealand's **RIGHT HEMISPHERE** has acquired the Russian company **X-DIMENSION SOFTWARE**, the company which developed *3D Exploration* for viewing and managing 3D assets.

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WHAT YOU'VE MISSED…

ISSUE 08

We discussed the *Dungeons & Dragons* movie, gave you 50 tips for *Softimage/XSI* and James Hans and Bill Fleming talked about major modelling projects.

ISSUE 09

We talked to Jeff Lew about his superb short animation *Killer Bean 2*. We also asked Pixar about its 'cartoon' *For The Birds* and featured a comprehensive *max* tutorial.
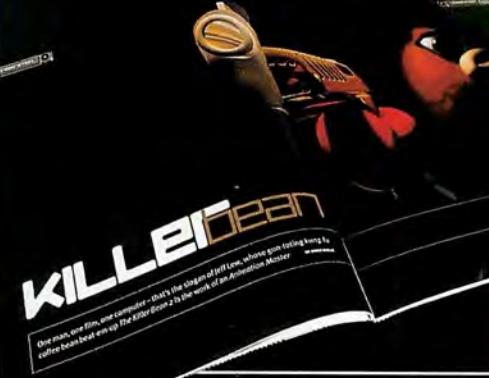
ISSUE 10

In which we talked about the holiday remake of *Monkey!* by Cinesite and showed you how to model an uncannily realistic hand in whatever package you favour.

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Myst

LOOKING BACK

Rand Miller recalls how a passion for building virtual worlds resulted in one of the most ground-breaking titles ever released, the multi-million selling computer game, *Myst*

BY MARK RAMSHAW

F ew anticipated the impact point-and-click adventure game *Myst* would have, least of all its creators. Formed in 1987 by brothers Rand and Robyn Miller, Spokane-based developer Cyan Worlds had successfully broken new ground with premier release *The Manhole*, the first entertainment product released for CD-ROM – but this and several subsequent equally whimsical, child-oriented products couldn't prepare the brothers for the success *Myst* was to enjoy. "Our goal with *Myst* was just to make a game that we wanted to play," recalls Cyan CEO, Rand Miller. "That it caught on

begin to piece together as you played, some of which would only be hinted at."

Although the brothers were conversant with many of the classic text and graphic adventures of the 1980s, the intention was not to create an adventure game as such. "We just wanted to build a rich, detailed world to explore. We knew, though, that we needed to extend the time it took to explore the world. We didn't want to extend it by having the player lose by taking a wrong turn or die or get permanently trapped, but we needed a way to slow them down a bit. Adding the puzzles as obstacles to overcome and goals to accomplish

MYST, RELEASED IN 1993, HAS BECOME THE BEST-SELLING VIDEO GAME OF ALL TIME

with so many people was incredibly satisfying, but not something that we had hoped for or expected. The publisher predicted that we'd only sell 30,000 units. We believed it would do better than that, but had no idea just how much better."

In fact, *Myst*, released in 1993, has become the best-selling video game of all time, received countless awards and spawned a series that survives to this day. There's even been *Pyst*, a parody of the original adventure. Work began on the *Myst* project in 1991, with an intention to apply the world-building skills acquired developing children's software to a title suitable for all ages. From the beginning, it was conceived for the CD-ROM format, then something of a hi-tech luxury.

"We started with the story of the game and a detailed back-story for each of the characters," recalls Rand. "This was done so that you as the player would have a feeling of being dropped into a world with a real history, some of which you'd

solved this problem and gave a more satisfying reward along the journey," says Rand.

REVOLUTIONARY POLYGONS

The game is best remembered for its 3D landscapes, sporting a polygon count considered revolutionary at the time. Yet the original intention was to use hand-drawn stills for each location in the game world, as with the earlier children's products. "We just happened to have purchased *StrataVision* out of personal curiosity for the technology and after playing with it a while, decided we could make the entire game with the 3D pre-rendered environments," says Rand. "Our development approach was somewhere in between 'hobby' and 'disciplined'. We started by locking down the big things: the main story, the themes, the main characteristics of the Ages, and some of the main puzzles. This process took a little over a solid month of design work."

THIS SPREAD Various shots, including the interior of a lighthouse, show the use of curved surfaces. Even though polygon counts were limited, Cyan never shied away from organic environments.

1993

"FROM A DESIGN PERSPECTIVE, WE WERE INFLUENCED BY JRR TOLKIEN AND CS LEWIS"

RAND MILLER

By the end, they had created an overhead map for each of the game's Ages (the story takes the player on a journey through five distinct subworlds), with the main puzzles designed but much of the fine detail still to be determined, tweaked or changed further down the line. "From a design perspective, we were influenced early on by writers such as JRR Tolkien and CS Lewis. They inspired us to believe that other worlds could be imagined. We also played a little *Dungeons & Dragons* back in our youth, though even then we enjoyed making our own worlds more than exploring and working through 'canned' ones," says Rand.

To create the visuals, Macintosh Quadras were used to power the *StrataVision* software, with some of the game's outdoor locations taking up to 48 hours to render. "Of course, in comparison to what we were able to do for *Riven*, everything in *Myst* was very low polygon count," recalls Rand. Even moving a single model in a scene would add further delays and extra frustration. "After repositioning a camera, it would sometimes take several minutes for the wireframe to redraw. Lots of magazines were perused during that re-rendering time," remembers Rand. "We really just found the tools and learned to use them as we went along. When we started, we had no idea how we'd pull off the things we wanted to do. It seemed that every time we had a problem, a tool had just been released that addressed that problem. This was true of the three main tools we used to make the game – *StrataVision*, *QuickTime* and *HyperCard*. It all fell together perfectly."

Myst and sequel *Riven* have now notched up more than $250 million in sales, equating to almost nine million units. And in addition to setting new standards for pre-rendered 3D computer graphics, *Myst* arguably changed the whole face of computer gaming, introducing millions of non-gamers to the delights of computer entertainment for the very first time.

FACT FILE

BY Cyan Worlds

WEB www.cyan.com

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CREDITS *Spelunx, The Manhole, Cosmic Osmo, Cosmic Osmo And The Worlds Beyond The Mackerel, Riven, RealMyst, Myst III: Exile*

AWARDS Best Fantasy Role-playing/Adventure Game – Software Publisher's Association; Critics' Choice Award & Best User Interface – Software Publisher's Association; World-Class Award – *MacWorld* magazine; Best Graphics and Best Art Direction – Cybermania; *BYTE* Award of Distinction – *BYTE* magazine (1994); *Newsweek* Editors' Choice Award – *Newsweek*; Best International Product – International Emma Awards, and many more

THE LEGEND LIVES ON

A selection of some of the many sequels and re-interpretations of *Myst*

MYST MASTERPIECE EDITIONS

The same classic design, enhanced to make better use of the changing audio and video capabilities of the Mac and PC.

RIVEN

The first sequel to *Myst* arrived in 1997. Sprawled across five CDs (and also released on DVD), it featured full-motion graphics and far more graphically complex environments than its predecessor.

REALMYST

Released last year, *RealMyst* brings the original back into the spotlight again, reworking the design to utilise real-time 3D. It's a testament to how quickly video technology has improved that the scenes are as complex as the static ones in the original *Myst*.

MYST III: EXILE

Developed for Cyan by Presto Studios, the newly released *Myst III* enhances the first-person adventuring by providing full 360-degree rotatable views from every location.

cd interactive

LightWave 6.5b update

Update your licensed version of 6.5 or experience the functional demo

This is an update patch for *LightWave 6.5* bringing existing users right up-to-date with all the latest features. If you do not have an existing *LightWave* licence, install this update and you will be in possession of a fully working demo of *LightWave 6.5b*. The main limitations are the absence of support files and the fact that renders have a checkerboard overlay on them. You also can't save scenes in Layout. This said, you can still experience the many new features of *LightWave* and witness the power of this leading 3D software package.

Also included on the disc are a manual and benchmarking scenes. The manual is a stonking 1,030 page PDF document covering just about every aspect of *LightWave's* modelling and animation capabilities – if you can't find the solution to your problems with this then you're reading the wrong manual. The folder of benchmarking scenes demonstrates how well your system is going to perform while running *LightWave*.
CONTACT: www.newtek.com

With *LightWave's* advanced HDRI system, the ability to burn in HDR/radiosity greatly speeds up rendering time. Also, the package offers great particle-collision algorithms.
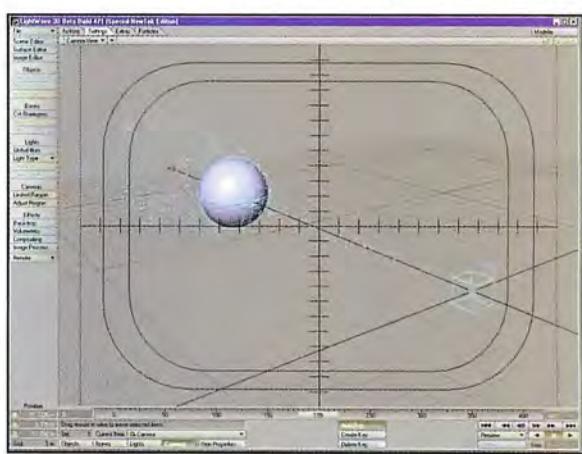
Kelseus Cloth

Simulate fantastically realistic fabric motion with this great plug-in for *3ds max*

Creating realistic simulations of fabric in motion has long been one of the most difficult aspects of 3D modelling to solve. The ability to dress a figure and then get the clothing to behave believably when the figure moves is therefore the objective to aim for.

This *Cloth* plug-in from Kelseus has received widespread recognition as one of the easiest ways to simulate realistic cloth in *3ds max*. This demo of the plug-in demonstrates the simplicity and speed of *Cloth*. Simply drag the 'resources\Kelseus' folder on to your machine and follow the installation instructions (install.txt). Also to be found in the same folder are four tutorial files for each version of *max*, a PDF manual explaining how to use the plug-in and a sample animation showing *Kelseus Cloth* in action.

CONTACT: www.kelseus.com

o2c-Player

Online 3d viewer for your PC

There seem to be many 3D viewing plug-ins for the Internet coming out recently and the *o2c-Player* is the latest one. What *o2c* offers is a high degree of interactivity plus a great level of detail available in its modeller, with a reasonable compaction, meaning that the 3D content produced is suitable for real-time online viewing. This plug-in for both *Internet Explorer* and *Netscape Communicator* enables 3D content to be viewed and manipulated online in real-time. This bundle comes complete with a wide selection of example objects demonstrating the level of modelling quality and the interactive elements of *o2c's* content.

CONTACT: www.o2c.de/englisch/index.html
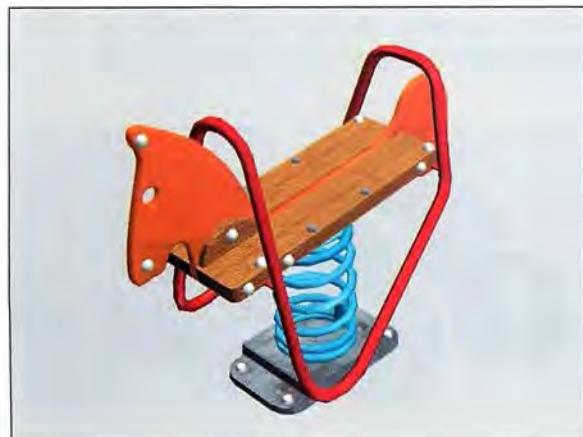
BESM plug-in

Anime-style art with *Big Eyes, Small Mouth*

Cel shaded's *Big Eyes, Small Mouth (BESM)* is a shader which allows a cartoon or anime style of rendering within *LightWave*. Similar to *CartoonREYES* for *max*, this plug-in enables you to flatten the render and create a true 3D model with a pseudo-2D appearance.

CONTACT: www.celshaded.com

Texture-tastic

80 Noctua Graphics textures

A superb collection of 80 textures selected from the Noctua Graphics Web site

This collection of 80 textures from Noctua Graphics includes a wide variety of rendered and photographic images, most of which are tileable in one or more directions and are at least 512-pixels square. Among many others, this selection includes sky, stone, leather, paper and grass as well as various bump/transparency maps. The Web site contains many more textures, subdivided into 20 categories plus tutorials, objects and materials for *C4D*. All Noctua Graphics' products can be purchased via HiSoft.

CONTACT: www.noctua-graphics.de or www.hisoft.co.uk

LightWave 5.6–6.5 and Inspire3D
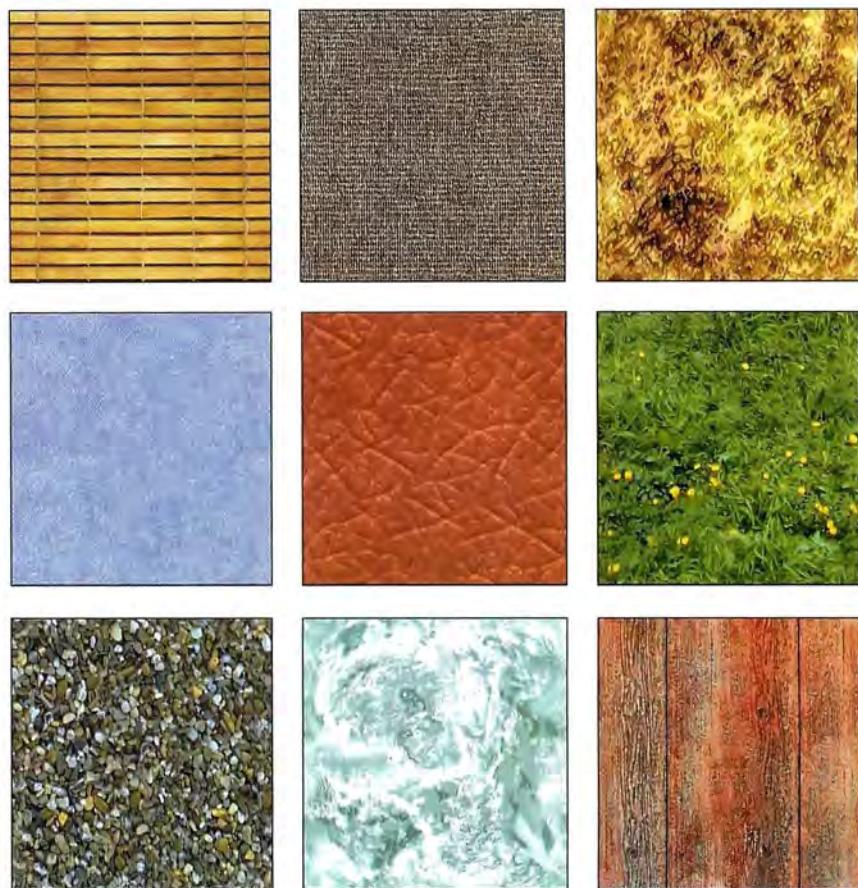
IFW shaders

Demos of *IFW* procedural shaders

This demo version of the *IFW shaders* collection provides over 30 procedural shaders for *LightWave 6.5* and over 70 for *LightWave 5.6* and *Inspire3D*. Procedural shaders are often used in preference to image textures due to the fact that they can be applied to objects and take up considerably less memory than their texture counterparts.

CONTACT: www.shaders.org

DVGARAGE

Alex Lindsay has provided this first selection of seven educational movies, detailing how to produce amazingly photorealistic textures for your 3D modelling projects. Look out for many more in future issues.
CONTACT: www.dvgarage.com

EXHIBITION

As usual, we bring you this issue's pick of the crop from the world of 3D.

RUSTBOY

The intro movie of the on-going project as featured on page 26 of *3D World*.
CONTACT: www.rustboy.com

POSER COMPETITION

The 20 best entries to our *Poser* competition are included on this disc. The wide variety of props received demonstrates the perverse character of, not only our readers, but *Poser* users in general. We felt obliged to leave out the huge collection of imaginative sex aids we received.

TUTORIAL FILES

This issue sees the return of the high-resolution screenshots from our tutorials. We also offer you the screenshots from last issue's tutorials which we were unable to fit on to last issue's cover CD as it was packed to the gills with fantastic software and resources. You can find all the tutorial files in the application directory of the CD.

3DiTV – the next big thing?

The proliferation of powerfully connected 3D platforms signals a new era in interactive entertainment

BY SIMON DAVIES

Last issue, I briefly discussed the content-production opportunities that could be presented by connected interactive platforms: Pace's set-top box based on Dreamcast, Sony's PlayStation, and Microsoft's Xbox. So let's take a closer look. Of course, the obvious thing to do with these boxes given their heritage is online gaming. Most titles produced these days already have a multiplayer mode in them and will adapt easily to online game playing. Sega already did this successfully with the launch of the Dreamcast console (now licensed to Pace). MS has already announced a deal to work with Japanese telco NTT to bundle a connection for online gaming, while Sony has announced a deal with Telewest in the UK to begin testing online gaming with Telewest's broadband cable network. As broadband becomes more widespread, having your game console/set-top box connected will become the norm. This will give rise to what I have christened 3DiTV.

So what else can you do with a powerful connected 3D platform? With a broadband connection, it will be possible to stream 3D content into the box and deliver 'live-rendered' 3D programming to the home. This could be simply a playback-only kids' cartoon, or incorporate varying levels of interactivity. You would be able to choose which character's point of view to see the show from. Imagine Tom and Jerry viewed from either the mouse or cat perspective. You could even have a real-time 3D soap opera running where you could follow the storyline that interested you, rather than just watching the 'director's cut'. Conceivably, the 3DiTV viewer would be able to take part in the action and influence events, although this could get a bit chaotic if everyone wanted to do it at once.

With this ability to deliver 3D interactive TV would come the opportunity for advertisers to create 3D interactive advertising. Advertisers could create little 'gamelets' to brand and advertise their products. Imagine a little game based around the Milky Bar Kid, for instance. This particular TV commercial was computer-animated so the 3D characters are already built and could easily take on a life of their own when let loose in an 3DiTV environment. Much of the reason for the slow take-up of iTV advertising is that the audience is not particularly techno-savvy. The potential audience for 3DiTV, however, will most likely come from the growing ranks of 3D gamers, all of whom have at least a basic grasp of navigating a UI.

With a server-based 3D world where fitting data on to a CD is not a limitation, it will be possible to build vast 3D worlds without constraints. The possibilities for huge multiplayer games with detailed environments stretching across virtual continents and beyond are mind-boggling. This will provide a daunting challenge for anyone involved in content creation – how do you set about building a virtually infinite 3D environment?

SIMON DAVIES is the Managing Director of Sitracom.
www.sitracom.com

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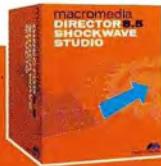
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